ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF

THE ILLINOIS STATE MEDICAL SOCIETY

VOL. LV | OAK PARK, ILL., JANUARY, 1929 | No. 1

ILLINOIS MEDICAL JOURNAL

Published monthly by the Illinois State Medical Society under the direction of the Publication Committee of the Council.

GENERAL OFFICERS, 1928-1929

PRESIDENT.....JOHN E. TUITE, Rockford
PRESIDENT-ELECT.....F. O. FREDRICKSON, Chicago
FIRST VICE-PRESIDENT.....J. P. SIMONDS, Chicago
SECOND VICE-PRESIDENT.....E. P. COLEMAN, Canton
TREASURER.....A. J. MARKLEY, Belvidere
SECRETARY.....HAROLD M. CAMP, Monmouth

THE COUNCIL

D. B. Penniman,	1st District, Rockford	1929
E. E. Perisho,	2nd District, Streator	1929
S. J. McNeill,	3rd District, Chicago	1929
J. S. Nagel,	3rd District, Chicago	1931
R. R. Ferguson,	3rd District, Chicago	1930
Wm. D. Chapman,	4th District, Silvis	1931
S. E. Munson,	5th District, Springfield	1931
Chas. D. Center,	6th District, Quincy	1930
I. H. Neece,	7th District, Decatur	1931
Cleaves Bennett,	8th District, Champaign	1929
Andy Hall,	9th District, Mt. Vernon	1930
J. S. Templeton,	10th District, Pinckneyville	1930

EDITOR

CHARLES J. WHALEN.....25 E. Washington St., Chicago

GENERAL COUNSEL

ROBERT J. FOLONIE.....281 S. La Salle St., Chicago

PUBLICATION COMMITTEE

J. W. VAN DERSLICE, *Secretary*.....155 N. Ridgland Ave., Oak Park

MEDICO-LEGAL COMMITTEE

J. R. BALLINGER, *Chairman*..2724 West North Avenue, Chicago
GEORGE H. WEBER, *Secretary*.....Peoria

EDUCATION COMMITTEE

MISS JEAN MCARTHUR, *Secretary*
185 N. Wabash Avenue, Chicago

SCIENTIFIC SERVICE COMMITTEE

JAMES H. HUTTON, *Chairman*, 6056 Cottage Grove Ave., Chicago
HAROLD M. CAMP, *Secretary*.....Monmouth

Outside of editorial or allied views or statements that are the authoritative actions of the Illinois State Medical Society, the organization denies responsibility for opinions and statements published in the ILLINOIS MEDICAL JOURNAL. Views expressed by the various authors and views set forth in various departments in the Journal represent the views of the writers

State Society will pay no bills for legal services except those contracted by the Committee. Notify the Chairman at once. Do not employ attorneys.

Send original articles, advertising copy, cuts and all communications relating to advertising to Dr. Charles J. Whalen, c/o Illinois Medical Journal, 185 N. Wabash Ave., Chicago.

Membership correspondence to Dr. Harold M. Camp, Monmouth, Ill.

Society proceedings and news items and changes in the mailing list to Dr. Henry G. Ohls, Managing Editor, 1618 Juneway Terrace, Chicago.

Contributors will submit all copy for publication typewritten on standard size paper and double spaced. Copy not complying with this rule will be returned, if convenient.

Subscription price of this Journal to persons not members of the Illinois State Medical Society is $3.00 per year, in advance, postage prepaid, for the United States, Cuba, Porto Rico, Philippine Islands, Hawaiian Islands and Mexico. $3.50 per year for all foreign countries included in the postal union. Canada, $3.25. Single current copies, 50 cents.

Editorial

A HAPPY NEW YEAR

TARES OF 1928 MUST BE WEEDED OUT IN 1929

Future for Civilization Depends Upon Democracy's Non-Abuse of Economic Possibilities.

Happy New Year Possible Only If Democracy's Rights Are Conserved.

To wish good fortune is foolish, without pointing out the way in which to find it. To stand upon the threshold of 1929, and to remark "Happy and Prosperous New Year to All" would indeed be fatuous unless at the outset a warning is given as to the noxious plants, sown from socialistic seed, that threaten to choke whatever garden of plenty that science and progress may have laid out for the benefit of mankind.

With the evils of maternity welfare legislation, the increasing tendency to the lay dictation of medicine and the encroachments of that same state medicine that has given England and Germany the worst medical service in the world, readers of this periodical have become familiar, as year after year these columns have detailed the spread of these invidious evils. Within the last year still another factor has become a matter for potent recognition.

In the pay clinic, medicine as well as public welfare has a malign host with which to reckon. In these organizations is found not only a corporation practicing medicine, but an endowed corporation, resulting thus in an institution, ordinarily not only lay-dictated and governed, but so financed as to make competition therewith an impossibility for not only the individual medical man, but for any group of such men.

In Illinois, sponsors of the pay clinic are Julius Rosenwald and Edward N. Hurley, who have acknowledged themselves as believers in the pay clinic, to the extent of backing such institutions financially. Misguided indeed are these two men, wise in their own spheres of commerce and finance, but ignorant of the very essence

and spirit of that altruism that through the ages has made possible not only the perfection of the science of medicine but the spirit of the men who have administered this vital science.

The high grade physician is not a man who can be bought. His ethics like his skill are of themselves things apart, and as soon as these qualities become subservient to journeymen tactics the physician as a genuine physician ceases to function. Advocates of the pay clinic are reformers following a will-o'-the-wisp, and adventurers in an unknown land, strong in their own conceit but not wise even in that possession.

If ever vital demonstration were made of the danger of a smattering of knowledge it is in the idea of the laity that the science of medicine needs lay management. Mr. Hurley would resent management of his factories, Mr. Rosenwald interference in his mail order houses by men and women unaccustomed to the ins and outs of commerce, the short cuts and sharp corners of trade. Yet these same "good business men" think nothing at all of proffering their unasked advice, nay, of rankly usurping the most sacred rights of the inviolable profession of medicine.

For the benefit of the citizenry it is to be hoped that enlightenment as to the viciousness of the pay clinics will be widespread before the year 1929 shall have drawn to a close. The American people is notoriously slow to discover the P. T. Barnums in their midst and has long since, as a nation, forgotten the fable of the vendor of cheap razors who, it will be remembered, when taxed by a customer with the protest that the razors wouldn't cut, in reply to the query, "What were the razors made for, then?" made answer, "Why, sir, to *sell*." A great many of the pseudo-reforms visited upon the tax-payers each year are frankly of the same kidney. Postwar hysteria lingers among us, and socialistic and communistic innovations having failed and fallen in soviet Russia are seeking, in many gilt-edged disguises, a stranglehold upon the United States, its institutions and its public welfare.

Drastic in its far reaching effects as the pay clinic are the activities of the Children's Bureau in Washington, chief of the effects of which has been the Sheppard-Towner bill, reappearing this winter in strengthened and even more malicious guise as the Newton Bill, Not content with the farcical results of the Nineteenth Amendment, or perhaps spurred on through the tremendous illicit profits made as a result of this emergency war measure in continuity, statute books of the country have become fallow fields for the fattening of all sorts of political bosses seeking a source of revenue dealing jobs for their henchmen, In the last analysis this is the fundamental of the greater portion of the "welfare" legislation meted out to a long suffering populace,

Epitomizing the warning against ambuscade, let repetition be made that the best gift the new year can bring to both the medical profession and to the community at large is a public awakening to the fact that doctors should practice medicine and the laity, like the cobbler, "stick to its last,"

With sincere hope for such a consummation so devoutly to be wished, the ILLINOIS MEDICAL JOURNAL wishes its patrons, owners and readers a happy new year,

---

THE NEWTON BILL BETTER DESIGNATED THE SHEPPARD-TOWNER NEWTON BILL.

THIS BILL HAS THE OLD SHEPPARD-TOWNER ACT BACKED OFF THE MAP

IT CALLS FOR AN APPROPRIATION OF ONE MILLION ANNUALLY FOR THE CHILDREN'S BUREAU

A CHARGE OF DYNAMITE SUFFICIENT TO BLOW UP THE UNIVERSE IS CONTAINED IN THE TITLE OF THE BILL "TO PROVIDE A CHILD WELFARE EXTENSION SERVICE AND FOR OTHER PURPOSES"

As the protagonists for the Sheppard-Towner Act cede that this vicious piece of legislation is now practically dead these mercenary socialists have proceeded to raise it by proffering a ghost that is stronger than its original entity. In fact H. R. 14070 introduced May 28 by Representative Newton of Minnesota, may be said to have the poignancy and force of a phoenix newly risen from the ashes of public wrath that consumed the Sheppard-Towner bill and its iniquities.

The bill speaks for itself. Herewith is its reproduction. Read this through. Then for future reference, file. In this way we will be spared the future necessity for sending additional

copies to those who happen to have misplaced this number of the JOURNAL.

H. R. 14070

IN THE HOUSE OF REPRESENTATIVES

May 28, 1928

Mr. Newton introduced the following bill, which was referred to the Committee on Interstate and Foreign Commerce and ordered to be printed:

A BILL

To provide a Child Welfare Extension Service, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be appropriated annually a sum of $1,000,000 for the purpose of paying the expenses of a Child Welfare Extension Service in the Children's Bureau of the department of Labor, which shall promote the welfare and hygiene of mothers and children and aid in the reduction of infant and maternal mortality: *Provided,* That of this amount not to exceed $50,000 shall be expended by the Children's Bureau in the District of Columbia and that the remainder shall be expended either independently or in cooperation with the State or Territorial agencies responsible for or engaged in the promotion of the health or welfare of children, or through such State or Territorial agencies, with county or municipal agencies engaged in child hygiene or child welfare work: *Provided further,* That the expense of such joint services as shall be undertaken shall be defrayed from the appropriation herein authorized and such cooperative funds as may be voluntarily contributed by State, Territorial, county and municipal agencies, or child welfare or other local associations or individuals.

Sec. 2. There is hereby created an Advisory Committee of Maternal and Child Welfare for consultation with the Chief of the Children's Bureau relative to the extension work to be carried on under the provisions of this Act. Said committee shall include the Surgeon General of the United States Public Health Service, the United States Commissioner of Education, and the Director of Extension Work of the United States Department of Agriculture, who with the Chief of the Children's Bureau shall be ex officio members of the committee and serve without additional compensation. Five other members of the said committee shall be appointed by the Chief of the Children's Bureau, with the approval of the Secretary of Labor, from representatives of recognized branches of child health and child welfare work not in the regular employment of the Federal Government: *Provided,* That at least one of these representatives shall be a State health officer belonging to the Conference of State and Provincial Health Authorities of North America. The terms of service of the members first appointed shall be so arranged that the term of one member shall expire each year, the subsequent appointments to be for a period of five years. The said members not in the regular employment of the Federal Government shall each receive allowance for actual and necessary traveling expenses and hotel expenses while in conference: *Provided,* That such expenses shall not be allowed for more than ten days in any one fiscal year. Appointments to fill vacancies occurring in a manner other than as above provided shall be made for the unexpired term of the member whose place has become vacant.

Sec. 3. No portion of any moneys appropriated under the provisions of this Act shall be applied directly or indirectly to the purchase, erection, preservation, or repair of any building or buildings, or equipment, or for the purchase of any buildings or lands, nor shall any such moneys be used for the payment of any maternity or infancy pension, stipend or gratuity.

Sec. 4. No official, agent, or representative of the Children's Bureau shall by virtue of this Act have any right to enter any home over the objection of the owner thereof, or to take charge of any child over the objection of the parents, or either of them, or of the person standing in loco parentis or having custody of such child. Nothing in this Act shall be construed as limiting the power of a parent or guardian or person standing in loco parentis to determine what treatment or correction shall be provided for a child or the agency or agencies to be employed for such purpose.

The bill was referred to the Committee on Interstate and Foreign Commerce which is made up as follows:

James S. Parker, New York; John G. Cooper, Ohio; Edward E. Denison, Illinois; Schuyler Merritt, Connecticut; Carl E. Mapes, Michigan; Walter H. Newton, Minnesota; Homer Hoch, Kansas; Adam M. Wyant, Pennsylvania; Olger B. Burtness, North Dakota; John E. Nelson, Maine; Thomas J. B. Robinson, Iowa; Milton C. Garber, Oklahoma; Noble J. Johnson, Indiana; James M. Beck, Pennsylvania; Sam Rayburn, Texas; George Huddleston, Alabama; Clarence F. Lea, California; Tilman B. Parks, Arkansas; Robert Crosser, Ohio; Ashton C. Shallenberger, Nebraska; Parker Corning, New York; Jacob L. Milligan, Missouri; George C. Perry, Virginia.

HEARING ON THE NEW SHEPPARD-TOWNER NEWTON BILL WILL PROBABLY TAKE PLACE IN JANUARY AT WASHINGTON, D. C.

Hearings will be held about January 14th, 1929. This date is only a guess but is based on these facts, but as Patrick Henry said: "We know of no way of judging the future except by the past," and we know that every previous hearing on one of these "WELFARE" measures has been held according to the convenience of the interested lobby organizations. They have usually sprung hearings when the General Federation of Woman's Clubs' Board meeting and the meeting of the maternity act directors take place, or in the middle of January—when the club women, and those drawing salaries under the maternity act, are in Washington ready to agitate among congressmen for extension.

This year, the General Federation Board meeting of this welfare bill will be held in Washington on January 9, 10 and 11. Therefore, hear-

ings on the Newton bill will be sprung either on January 12 (Saturday) or January 14 (Monday), without any adequate previous notice to the public at large. The Interstate and Foreign Commerce committee (to which the bill was referred) professes to know nothing about when the hearings will be held—if at all—and suggest asking Mrs. Marguerite Owen of the League of Women Voters. The Children's Bureau likewise refers all inquiries about the bill to Mrs. Owen.

As Mrs. Carrie Chapman Catt (founder and financial backer of the League of Women Voters) goes to Washington with her gang January 15, to open another "conference on the cause and cure of war," the chances thus are excellent that Mrs. Owen (who is giving out no advance information, however) will set the hearing for January 13 or 14, so that all the club women and League of Women Voter people will be in Washington to testify and "work" on Congress, without missing any of their own meetings as club women January 9, 10 and 11, or as pacifists on January 15.

THE CHILDREN'S BUREAU AND ITS ALLIED ORGANIZATIONS WORK THE HEROD RACKET TO PUT OVER THE SHEPPARD-TOWNER BILL

The Herod Racket Will Again Be Used to Put Over the Newton Bill

The Children's Bureau Claim Credit for All Maternity Salvage and Further Exploits Its Mail Order Long Distance Treatment for a Slush Fund Fee of One Million Dollars

Doctors and nurses who save mothers and babies should be on the alert for the "Herod Racket" that the Children's Bureau will attempt to push down the throat of Congressmen in putting over the Newton Bill.

Every doctor or nurse or hospital that saves the life of a mother or babe is statistically appropriated by the bureaucrats, who credit any reduction of infant or maternal mortality not to the doctors and nurses on the spot and on the job, but to the "mail-order" or "long distance" treatments that mothers received from the social workers of the Children's Bureau. No advance in medical science or practice is "saving mothers and babies" but "only the Children's Bureau," and that any Congressman who would vote to stop this bureau is as guilty as Herod of "wanting babies to die." Mrs. Kelly worked the "Herod racket" to get through the original act; now the Children's Bureau and all its allied organizations are going to work the "Herod racket" again to get that one million dollar "slush fund" for the social welfarers under the Newton Bill. If anything, the Newton Bill is worse than the Sheppard-Towner Act, as the $1,000,000 will be the bureau's to distribute almost at will—to such "child welfare" agencies as Hull House, Henry Street Settlement, and similar organizations—without let or hindrance from State health boards.

Medical men and the medical *women's* auxiliary should be prepared to make a strong showing against the Newton bill. It is "permanent legislation" if passed—and gives this radical Bureau that is always usurping both the provinces of the medical profession, as well as the political rights of the States and people, a permanent *campaign fund* of $1,000,000 a year for distribution among agencies that "submit" to national care of maternity and infancy by bureaucrats at Washington giving "long distance" or "mail order" treatments to mothers, via the Government Printing Office, and setting "standards" for physicians and nurses that the "social workers" desire to promote.

Physicians should handle the medical and scientific side of the opposition so as to stop the effectiveness of the "Herod racket," and handle the political data and constitutional arguments through several able men in Congress. But, as everyone knows, the constitution of the United States counts for nothing when the bureaucrats bring in (through Dr. Copeland, Senator Sheppard, Mr. Newton et al.) juggled claims of "saving babies" through books and bureaucrats. When more mothers and babies die, however, "ignorant doctors" are held responsible.

TRAVELING EXPENSES NOW DEDUCTIBLE FROM INCOME TAX

THE MEDICAL FRATERNITY IS INDEBTED TO DR. CECIL M. JACK OF DECATUR, ILLINOIS

The end of the year has come upon us and the voice of the income tax is heard in the land with one of the sweetest notes in the melody that decision made in all justice and only in justice that traveling expenses incurred by physicians in

attending meetings of medical associations are deductible in the income of their federal income taxes, and the Comissioner of Internal Revenue has erred in denying the deductibility of such expenses. The Board of Tax Appeals made this decision in October of this year in passing upon the appeal of Dr. Cecil M. Jack of Decatur, Illinois. As the commissioner did not appeal against similar decisions rendered by the Board of Appeals in similar cases appertaining to ministers and chemists in cases identical in essential circumstances with the case of Dr. Jack it is not expected that an appeal will be here taken so that the decision will become final at the expiration of six months from its promulgation unless an appeal is taken to the courts prior to April 2.

Commenting on this case the A. M. A. remarks:

"Since the Commissioner of Internal Revenue first denied to physicians their right to deduct traveling expenses, in 1922, the medical profession has paid probably as much as a half million dollars into the treasury, to avoid unlawful demands by the commissioner, the distraint of property, and suits. Subject to certain limitations on the time within which claims for refunds must be filed, all of this money will be repayable to the physician who paid it, if the courts are not called on within six months to reverse the decision of the Board of Tax Appeals and if on appeal they sustain the decision of the board.

"Applications for refund may be filed without waiting for any further official action in the case. Claims for refunds for the tax years 1924 and 1925 must be made within four years from the date of payment; for the tax years 1926 and 1927, within three years; and for the tax year 1928, within two years. Unfortunately, in many individual cases the amounts repayable are probably so small that the physician will not feel justified in going to the trouble and expense of making a claim, and in many cases it will be difficult at this late date to produce adequate legal proof of the exact amounts paid for railroad fares, Pullman accommodations, meals, and other allowable expenses. Applications for refunds must be made on the special form provided for that purpose, copies of which can be obtained from the local collector of internal revenue. A separate application must be made for each year for which a refund is claimed. Every application must show that it is based on the decision of the Board of Tax Appeals in *Jack* v. *Commissioner of Internal Revenue.* Applications must be filed with the collector of internal revenue within whose district the refundable money was paid.

Comment was made in the *U. S. Daily* on October 16.

HANDED DOWN BY THE BOARD OF TAX APPEALS

Cecil M. Jack v. Commissioner of Internal Revenue, Docket Nos. 14995 and 17662, Board of Tax Appeals.

The tax payer contended here that he was entitled to a deduction for expenditures he had made in connection with attending conventions of medical associations. These expenditures were for railroad fare, hotel accommodations and meals. The Board of Tax Appeals sustained his contention, reversing the Commissioner of Internal Revenue. Other questions were decided adversely to the taxpayer because of lack of evidence.

Following is the full text of the findings of and the opinion:

Petitioner resides at Decatur, Ill., in which city he is engaged in the practice of medicine.

He expended during the years 1920, 1921, 1922 and 1923, the respective sums, $16, $230, $375 and $384.46 for railroad fare, accommodations and meals in connection with attending meetings and conventions of various medical associations. He deducted from gross income and Commissioner disallowed as deductions for said years the respective sums, $16, $230, $375 and $15.

"In those decisions above mentioned the commissioner officially acquiesced, without waiting for six months to expire, and there seems to be no reason why he should follow a different course now," continues the A. M. A. "Acquiescence seems more probable, too, since the board, in promulgating its decision in the present case, cited as precedents the very cases in which the commissioner had acquiesced, and repudiated as a precedent a decision of the board by which the commissioner undertook to justify his course. In that case, the board pointed out, it was necessary for the board to uphold the commissioner's denial of the right to deduct traveling expenses, because the physician had not submitted proofs

of the amounts expended. The only discoverable result that would follow an appeal by the commissioner is added expense and trouble to the taxpayer and to the government, an additional case to clog the court calendar, and, pending a decision by the court, many thousands of payments unlawfully exacted of physicians under the guise of taxation, to be added to the tens of thousands of such payments already exacted, all of which the government may be called on to refund."

All physicians who have kept accurate records of their expenses in attending medical meetings since 1922 can now obtain a refund of taxes on such sums if claims are filed promptly. Applications for refunds must be made on a special form (Internal Revenue Service, Form 843), which can be obtained from any collector of internal revenue. A separate form must be filed for each year.

Those who have kept no accurate records of their traveling expenses in this connection can obtain no refunds, but from this time on they should save Pullman stubs, receipted hotel bills, etc., and should take a receipt when buying railway tickets, so as to be able to back up any deductions they may claim in the future.

DENTAL ECONOMICS AT THE PHYSICIANS FELLOWSHIP CLUB

Before the Physicians Fellowship Club a program was presented by Dr. L. W. Morey for the Chicago Dental Society and the Chicago Department of Health for Dental Clinics in the schools.

According to *Northwest Medical,* salaries of dentists doing this work will be paid from appropriations made jointly by the Chicago Dental Society and the Chicago Department of Health.

Scientifically speaking, this periodical gives its encomiums to Dr. Morey, but adds, "We do not agree with the stand he takes on economics." Most emphatic condemnation of the scheme came from physicians in the subsequent discussion, save for two exceptions. Though the dentists agreed with Dr. Morey, save for two dissenters, comment revealed that the dentists had given very little thought to the subject and showed little knowledge of its economic bearings. Consensus holds that unless dentists and their leaders achieve a conception of economic right and wrong different from that possessed by medical leaders, this scheme and others similar will place the dental profession on the brink of the same chasm of state medicine, against which for years the medical profession has been staggering, and which system has proven so disastrous to the profession of medicine in England and on the Continent. The American public loses its sense of humor when assaulted by schemes of designing persons, animated by varying motives, personal profit, vanity or gain, or with political interests. Maudlin sentiment should stop. If a physician or dentist wishes to extend charity to someone from his own practice, that should be his privilege, or his duty, but to extend this beneficence to the patients of his fellow practitioners is an economic crime. Instead of going into the schools, the Chicago Dental Society, with the financial aid of the Health Department, should work with a committee of dentists from each branch, thus caring for the entire city, to the better results for the deserving poor, more profit to each member of the society, and imposition upon none.

NOTICE
SECTION ON RADIOLOGY
PROGRAM

Radiologists desiring to present papers before the Section of Radiology of The Illinois State Medical Society meeting to be held at Peoria, May 21, 22 and 23, 1929, are invited to write to Dr. E. G. C. Williams, Danville, Ill., Chairman of the Section or to the undersigned.

The title and draft or synopsis of the paper must be in our hands before February 1, 1929.

I. S. Trostler, M. D.,
Secretary Section on Radiology,
812 Marshall Field Annex, Chicago.

Correspondence

THE NEWTON BILL

Silvis, Illinois, December sixth, 1928.

To The Editor: I have studied H. R. 14070, known as the Newton Bill, and can best make reply to your inquiry of the third instant by entering a brief discussion.

As I read it, the bill proposes that the United States commit itself and embark upon a permanent policy of doing certain work in individual states, whereas Constitutional authority

and practice have, until now, held Federal action limited to interstate responsibilities.

The provision that Federal money may be expended at will and in the whim of a single bureau officer in cooperation with "local associations or individuals" (extragovernmental individuals) should be sufficient to brand the entire proposal as a golddigger's phantasy. I seriously doubt that responsible agents of government will be found so credulous as to permit such an arrangement. Certainly, I hope not.

The money which the bill proposes in this fashion to appropriate would come necessarily from tax collections, of which we are told that some 95 per cent. comes from twelve states. The expenditure outlined would rest with the whim of one individual and not only might be, but evidently is intended to be disproportionate among the several states. (It is within the bounds of conception that Illinois, contributing 7.96 per cent. as one of the twelve, might receive nothing at all in return), whereas, states contributing little or nothing would receive maximum sums.

In the matter of an "advisory committee" which the bill defines as being for show purposes only, I should take exception to the provision which prescribes that one member "shall be a State health officer belonging to the conference of," etc. That seems a very ill-advised class-recognition of extra-governmental groups. If it were to be accepted as proper legislation, I would wish to amend that one member of the Illinois Medical Society and one member of the Ministerial Alliance and one member of the Penobscott, Maine, chapter of the American Red Cross (if any) be included in the makeup of the "committee." These organizations have equal right with any other mutual conference.

Section 4 gives the inference that there is a plan to work with and upon individual children in the United States except where specifically prohibited by the parent or guardian of an individual child; such a plan can operate only upon the assumption that a child is the property of the State. That is a thing which I deny and which should cause alarm to the parents of children and to all American economists. The family is our unit of government and should be closely guarded against inroads of social thought. Whenever such inroads shall have been quietly perfected, then our government will be seen to have abdicated in favor of a communist revolution—not a desirable thing.

To me it seems elementary that work pertaining to the public health or to the physical welfare of citizens should fall to our recognized Public Health Service rather than be appended to the Department of Labor, with its normally economic major interests.

WM. D. CHAPMAN,
Chairman of the Council,
Illinois State Medical Society.

COMMENDS THE EDITORIALS IN THE ILLINOIS MEDICAL JOURNAL

Mayo Clinic, Rochester, Minn.
December 19, 1928.

To The Editor: I wish to commend the editorials which appear from time to time in the Illinois Medical Journal, and particularly wish to praise the articles in the last number, entitled "Educational Committee Has Gone Far and Accomplished Much." This is a brief and clear outline of the activities of an educational committee and could serve as a model program for every state association. Not only do you outline possible avenues of progress, but you logically present the reasons for such actions. This article should be widely reprinted and might well be read at some meeting of every county medical society. WILLIAM F. BRAASCH, M.D.

ROCKEFELLER GIVES ALBANY COLLEGE $100,000. PROVIDES FOR REGIONAL MEDICINE SERVICE FOR UP-STATE NEW YORK

New York, December 26, 1928.

To The Editor: I am here for an advertising section meeting. Thought the enclosed clipping from the *New York Herald-Tribune* of December 25 might interest your readers.

VIDA A. LATHAM, M.D.
1644 Morse Ave., Chicago, Ill.

ROCKEFELLER FUND GIVES ALBANY COLLEGE $100,000

Provides for Regional Medicine Service for Up-State Aid

ALBANY, Dec. 25.—A grant of $100,000 from the Rockefeller Foundation to the Albany Medical College to establish a department of regional medicine, was announced today by the school, a department of Union University.

The purpose of the department, it was said, will

be to work out a system of medical service for northeastern New York State by which towns and rural communities may obtain more of the opportunities for medical protection, which have hitherto been restricted chiefly to metropolitan areas having medical centers.

MR. HURLEY PROPOSES TO ESTABLISH A PAY CLINIC WHERE DOCTORS WILL DO THE WORK FREE AND WILL NOT BE INSULTED BY BEING PAID EVEN AN INADEQUATE SUM

Chicago December 11, 1928.

To The Editor:

Now that our medical society has seen fit to denounce the Life Extension Institute and its latest imitator, "The Good Health Institute," both of which pay the doctor who makes the examination, I wonder what they will say about the attempt of our friend (?) E. M. Hurley, who proposes to establish a place where doctors will do this work *free* and will not be insulted by being paid even an inadequate sum. My suspicion is that exactly nothing effective will be attempted. All that will be done will be to hand out a lot of "hooey" to those who are the "hewers of wood"—who pay the freight. You are not included in this, as you at least see that the socialists are after us.

WM. L. BEECHER, M. D.

25 East Washington St.

HAPPY NEW YEAR

THERE'S NOTHING IN THE WORLD TO WORRY ABOUT

In this life there are just two things—
Success and Failure.

If we succeed—There's nothing to worry about.
If we fail—There are just two things—
Health and Sickness.

If we have health—There's nothing to worry about.
If we are sick—There are just two things—
Get well or Die.

If we get well—There's nothing to worry about.
If we die—There are just two things—
We go to Heaven or to Hell.

If we go to Heaven—There's nothing to worry about.
If we go to Hell—We may be so busy shaking hands with friends
We won't have time to worry.

"Borrowed" by H. G. OHLS.

TEAMWORK!

("UNITED WE STAND—DIVIDED WE FALL")

We can't play ALONE in the game of life—
We're dependent, my friend, on OTHERS;
We cannot "get by" in the struggle and strife,
Except for the help of our BROTHERS!
Whatever we plan, or whatever we do;
Whatever we give of the best of us,
Is meant to include all our FELLOWMEN, too—
And add to the joy of the rest of us!

Whatever we "vision"; whatever we "dream"—
Be we lowly or lofty of station;
Whatever our "idea," "invention," or "scheme,"
We are working for all of creation!
God's running this world, and His vast Universe,
And blesses the worst and the best of us;
And the gifts He has made to divinely disperse
Are not only for YOU—but the rest of us!

We may call it by this name, or call it by that—
"Teamwork," or plain "Co-operation";
"TOGETHER WE STAND"—by ourselves we fall flat;
TOGETHER, my friend, we're the Nation!
Whatever we do, or whatever we plan—
We can't stand ALONE, e'en the best of us,
But must SHARE of our gifts with our good fellowman—
For we're only a PART of the rest of us!

—James Edward Hungerford.

THE JOY OF BEING THE EDITOR

Getting out this magazine is no picnic.
If we print jokes, people say we are silly.
If we don't, they say we are too serious.
If we clip things from other magazines,
We are too lazy to write them ourselves.
If we don't we are stuck on our own stuff.
If we stick close to the job all day,
We ought to be out hunting up news.
If we do get out and try to hustle,
We ought to be on the job in the office.
If we don't print contributions,
We don't appreciate true genius.
And if we do print them,
The magazine is filled with junk.
If we make a change in the other fellow's write-up, we are too critical
If we don't, we are asleep.
Now, like as not, some guy will say
We swiped it from some other magazine.
We did.

Note:—We did, we clipped it from California & Western Medicine.

LEARNING TO MILK THE COW

Farmer: "Now, come along and I'll teach you to milk the cow."

Cockney Hand: "Seein' I'm new to it, Mister, hadn't I better learn on the calf?"—*London Opinion.*

Original Articles

THE USE OF INTRAVENOUS LEAD IN THE TREATMENT OF CANCER*

R. T. PETTIT, M.D.

OTTAWA, ILLINOIS

Within the past two years those of us particularly interested in cancer and its treatment have had our attention directed to the work of Professor Blair Bell of the University of Liverpool and his method of treating cancer by the use of metallic lead intravenously. Naturally, when any new treatment presents itself in this disease the medical profession looks at it askance—too frequently the treatment is a rank fraud such as the "Koch Serum," or the claims of the new remedy, even though its originators are not dishonest, are not supported by sufficient scientific and clinical evidence to prove its value. It was only when Dr. Francis Carter Wood[1] interested himself in this method of treatment and showed conclusively by experimental evidence on rat tumors that it had some merit that I decided to make a first hand investigation to determine for myself whether or not it was a remedy I would care to use on my own patients.

First, in reading the reports of Professor Blair Bell and his co-workers I was struck by the high standard of their scientific work and their very modest claims of clinical results.

Convinced that here was a method of treatment of merit and fortified in my opinion by such men as Schamberg of Philadelphia and Bloodgood of Baltimore, I decided to go to Liverpool and devote whatever time was necessary to make a thorough investigation of the matter and this paper is a report to this Society of my investigation.

By way of introduction let me say that if any of you wish to go to Liverpool to visit Professor Blair Bell's clinic you will be welcomed if you have proper letters of introduction from some reliable organization or individual known to him such as the American College of Surgeons or Dr. Francis Carter Wood of Columbia University. It is impossible for him to receive every one and to know what their antecedents are and very properly he does not want his methods to fall into improper hands. Let me quote one of his recent papers.[1]

> There is still a considerable danger that if lead be used indiscriminately in the treatment of malignant disease many fatalities will follow, and the method itself, either from excessive caution or too much zeal, will be brought into disrepute. As we have already demonstrated, we ourselves have had disasters, and although our extensive experience has enabled us to avoid many more similar disasters, it is still quite possible for a patient to lose his life if incomplete investigations be carried out. Any person suffering with the slightest degree of renal impairment or cardiac instability or disease may died most unexpectedly as the result of a single dose. It is therefore incumbent upon us to protect the public as best we can and at the same time to safeguard the reputation of our work. This we feel can best be done by placing the therapeutic agent, when it is available, in the hands only of those who have had some experience of the method and have ample facilities for biochemical and other investigations. This means that if there be a desire in any special clinic to try out the method, a biochemist and clinician be sent to Liverpool to study for, say a week, the methods adopted, especially in regard to the selection of cases and their preparatory examinations. "Choriotrope," as we have called the preparation used by us, can only be bought with our permission and this will not be unreasonably withheld.

Lead is very toxic and dangerous and even though (at present) it should only be used in advanced and inoperable cases, one cannot ease his conscience in this instance by saying "it won't do any harm even if it doesn't do any good."

The use of intravenous lead in the treatment of cancer is founded on a very substantial theoretical basis and this theoretical basis is now supported by a mass of scientific data worked out by the Liverpool Cancer Research Organization.

Many years ago Professor Blair Bell, who is head of the Department of Obstetrics and Gynecology of the University of Liverpool, was struck by the similarity both morphologically and physiologically between the chorionic epithelium of the trophoblast and the carcinoma cell. Both were much alike in many respects. Both may have a syncitial arrangement, show a tendency to rapid growth, invasion of other tissues, erosion of blood vessels and metastasis. He also noted at an early date as his earliest publications will show, that lead poisoning causes a specific necrosis in the chorionic epithelium in pregnant animals, causing abortion. He has since shown in rabbits that one-half of the lethal dose of lead

*Read before the Section on Radiology, Seventy-eighth Annual Meeting of the Illinois State Medical Society, Chicago, May 10, 1928.

given intravenously will produce abortion quite consistently.

Starting from this basis and believing in the similarity between the chorionic epithelial cell which invades the maternal tissues seeking nourishment, and the carcinoma cell, which also invades other tissues for the purpose of seeking nourishment and having noted the susceptibility of the chorionic epithelium to lead (a property that was not shared by other metals) it occurred to Professor Bell that cancer cells might also be susceptible to the poisoning effects of lead if administered in sufficient amount.

Using at first metallic lead in a finely divided state intravenously in several advanced and hopeless cases some very striking results were achieved—certainly enough to encourage an extended and intensive study of the method.

In one of these early cases, an extensive sarcoma of the stomach, following the administration of the lead, the patient suddenly died of acute peritonitis and autopsy revealed a complete necrosis of the stomach at the post mortem. Professor Glynn could find no stomach, simply a mass of dead tissue.[2]

Another early case is reported as follows:[2]

On November 9, 1920, five years ago yesterday, a woman was admitted to my maternity ward at the Royal Infirmary, Liverpool, for her confinement which took place a few days later. She was suffering with an extensive ulcerated carcinoma of the left breast with glands in the axilla. Operation had been considered useless six months previously by two of my surgical colleagues. The growth had been ulcerated during pregnancy, as is usual in these circumstances. I was looking for just such a hopeless case.

A section was prepared from a piece of tissue adjacent to the ulcerated area, and intravenous injections of lead were given. Not only is the patient well today, five years later, but also she has had two more babies in the interval, both of whom she has suckled at the breast that was affected.[3]

These and several other instances were so striking that three years ago the Liverpool Cancer Research Organization was formed. The funds were furnished by several Liverpool citizens and more recently all funds received as fees from private patients for consultations, examinations, injections and hospital care have been received by this Committee and this body defrays the expenses in connection with both the clinical work and laboratory investigations. Certainly no one can accuse Professor Blair Bell and his co-workers of mercenary motives.

The organization is made up of the heads of the various departments in the University of Liverpool whose special knowledge could be brought to bear upon the different aspects of the problem and under these department heads full and part time research workers and clinicians are employed. About fifty reports have been published by the organization and as the work is well co-ordinated under the direction of Professor Blair Bell, a great deal has been accomplished in the fields of chemistry, biology, pathology, animal experimentation, pharmacology, and clinical medicine and surgery. There still remains, however, a great deal more to be done and it is to be sincerely hoped that sufficient funds will continue to be available to keep this organization together and working on the different phases of this problem.

The main thing now is the perfection of a lead compound with increased affinity for the cancer cell and decreased affinity for normal cells comparable to salvarsan in its relation to the spirochaete and the tissues and cells of the host. Up to the present time over fifty preparations have been tried out and little or no progress along this line has been made.

The problem, I am quite sure, however, is capable of solution with increased knowledge of the pathology and particularly the pathological physiology of cancer.

Let me refer briefly to some of the steps that have already been taken along this path that point, I believe, the way to future advances along this line.

As stated above, there are a number of things about the cancer cell that indicate a behavior similar to the cell of the chorion—invasion, erosion, rapid growth, multiplication, and metastasis. There are other similarities particularly chemical and physiological.

Blair Bell believes the cancer cell to be not an "undifferentiated" cell, but a "de-differentiated" cell, a reversion to an ancestral type forced upon it and this reversion is similar to that seen in all evolutionary processes seen in nature and like these reversions it is the result of adverse living conditions and the resulting increased difficulty in seeking nourishment. It is in fact the taking on of a less differentiated, orderly habit of life in the struggle for existence, and the chorionic epithelium represents

the ancestral type and the cancer cell a reversion to this type.

Elaborate experiments have been carried out by Professor Lewis and his associates that show quite clearly that the cancer cell and the chorionic cell have a similar degree of permeability (which indicates a similarity in capacity for growth and multiplication) and that the cancer cell is like the chorionic cell and unlike the normal somatic cell, or the cell of benign growths in that it has a very high phosphatid or lecithin content and a comparatively low cholestrol content.

Professor Lewis has also confirmed Warburg's remarkable discoveries. Warburg has demonstrated that the cancer cell differs from the normal cell in its ability to utilize oxygen.

The normal cell takes up oxygen and gives off CO_2—a normal respiratory capacity. The cancer cell, however, even in the presence of oxygen, does not have this capacity but derives its energy by splitting glucose with the formation of lactic acid. A cancer may have five times as much lactic acid as the surrounding normal tissues. Lewis has found that this same type of impaired respiratory capacity is seen in the chorionic epithelium.

These scientific discoveries have an extremely important bearing upon the selective action of lead on both the chorionic epitheliel cell and the cancer cell for the following reasons:

Lead when introduced into the circulation is in all probability converted into the tribasic phosphate either in the blood stream or in the tissues. In the presence of increased acid such as found in the cancerous tissues the tribasic phosphate which is comparatively insoluble is converted into the acid phosphate which is many times more soluble and toxic, thus causing a local increased toxic effect.

The question thus immediately presents itself. Why not use the less toxic lead phosphate? This is being done at present, but as yet sufficient time has not elapsed to reach a conclusion regarding its value. All I can say is that up to the present time over fifty modifications of the original lead preparation has been tried and most of them have been found to be inert or too toxic for practical use.

Until Blair Bell and his group have tried out the lead phosphate I do not feel like using it because of the failure of so many other lead compounds. He and he only is competent to judge of its relative value and he told me he would probably be in a position to report on it in the course of six or eight months.

Let me report to you the plan of treatment as worked out at Liverpool.

First as to the selection of cases. Let me quote Dr. L. Cunningham, Assistant Director of the Liverpool Cancer Research Organization.[4]

> In treating malignant disease with lead one of the greatest difficulties with which we have had to contend has been the selection of those cases which present a reasonable chance of being benefited and which at the same time are likely to withstand the toxic effects of the therapeutic agent employed. There are, of course, certain obvious contraindications to treatment among which must be mentioned gross pathological lesions of one or more of the important organs of the body, and serious cachexia of the patient. We have been brought face to face, however, with another problem, namely, the idiosyncrasy of the individual, which unfortunately discounts to a certain degree the investigations of the vital functions of the body, upon which, nevertheless, we lay considerable stress. We are unable to explain how it is that, other things being equal, some patients, for no apparent reason, are unaffected by large doses of lead, whereas others are made very ill, and may even die after a moderate dose.
>
> It has been our practice before undertaking the treatment of cases to make a complete analysis of the blood and urine, apart from the careful medical examination of the important organs of the body. We also make use of radiological studies where these are likely to be of assistance in diagnosis and in determining the extent of the disease. These investigations are carried out from time to time in the course of treatment; in particular observations are repeatedly made in regard to the blood and urine.
>
> In the case of the blood, full counts are made of the red and white corpuscles and the percentage of hemoglobin is estimated. The blood urea is also determined and in certain cases the blood sugar in the course of treatment is determined. We examine regularly, in the course of treatment, blood films for stippling of the red cells and this has been of great value in determining not only the dose of lead which should be given at any period but also the interval which should be allowed to elapse before a further dose is given. We usually suspend treatment when there is more than one stippled cell per field even in the absence of any other contra-indication.[4]

I found, in observing the work at Liverpool that the blood examination for stippling of red cells was the one most important guide to treatment—the usual clinical signs of lead poisoning as seen in industry such as lead line on the

gums, headache, wrist drop, and colic, while at times present were by no means constant or regular in their appearance.

The most important contra-indications to treatment were (a) myocarditis, (b) hypertension, (c) renal impairment and (d) anemia-hemoglobin less than 50 per cent. or red cells less than three million.

The preparation of lead that has been most consistently effective is a metallic suspension in gelatin prepared by the sparking method of Bredig.[3] Until some better preparation is perfected and has the approval of the Liverpool organization I do not believe in using any other lead preparation. Most of the lead compounds so far tried out have been found to be either too toxic or are inert in their action. However, I feel very sure that with further study particularly of the pathological physiology of the cancer cell and the pharmacology of lead compounds a preparation will be found with increased affinity for the cancer cell and decreased affinity for the normal cell.

The lead suspension is prepared as follows:

Silver free lead (assay lead) is melted and poured from a low height (a few inches) into water to form small shot-like masses. A handful of this lead is put into a large evaporating dish about eight inches in diameter with 500 c. c. of the sparking solution which is one-half per cent. "Difco" solution of gelatin containing 5 c. c. of two per cent. solution of calcium chloride per 500 c. c. The lead is sparked with either a direct or alternating current for about fifteen minutes. The current is reduced by placing five 600 watt conical resistances arranged in multiple down to 30 amp. at about 60 volts. The poles are bars of commercial lead about ¼ inch diameter and about 8 or 10 inches long, made of rolled sheet lead (assay lead). These are stirred about in the "shot" for about fifteen minutes or until the solution is quite black; decant into flask and cool in running water. The supernatant solution is siphoned off into a flask, and centrifugalized lightly (1760 R. per minute) for three or four minutes. A portion of this is poured off for assay for its lead content. Assay and bring to 500 mg. per 100 c. c. then add salt to make 1.1 per cent., then boil.

Colorimetric method for determining lead in Colloidal Solution. Five c. c. of the colloidal lead solution which is ready to be injected is placed in a 500 c. c. graduate and 2 or 3 c. c. of concentrated nitric acid added to make the solution water clear. Make up to 50 c. c. volume with distilled water and mix. Five c. c. of this placed in 100 c. c. graduate and shaken gently with 5 c. c. to 10 c. c. of a saturated solution of sodium acetate. Dilute to 50 to 60 c. c. and 3 c. c. of freshly prepared ½ per cent. gelatin solution and mix. Develop brown color with 5 c. c. or more of fresh hydrogen sulphide water and make up to 100 c. c. At the same time a standard is prepared as follows: 5 c. c. of standard solution of lead acetate containing 2 mgs. of lead to 5 c. c. are placed in another graduate and after adding two or three drops of nitric acid and the sodium acetate is also made up to 50 or 60 c. c., 3 c. c. of gelatin solution added and the color developed with hydrogen sulphide. Bring to 1000 c. c. The colors are then compared in a colorimeter. The calculation is made as follows:

$$\frac{\text{Reading of standard} \times \text{amt. lead in standard} \times 200}{\text{Reading of unknown}} = \text{sugar lead per 100 c. c.}$$

Example: $$\frac{30 \times 2 \times 200}{24} = 500 \text{ mgms. of lead}$$

In sparking the solution it seems to help to have the gelatin cold and place the evaporating dish in a dish of cracked ice.

After the suspension is prepared it is put in glass bottles with ground glass stoppers (previously sterilized) and the bottles filled to the top and promptly stoppered as the preparation oxidizes very rapidly to form lead hydroxide, the most poisonous of the lead compounds.

The suspension should be used within 72 hours and is always given intravenously. The first two dozes are usually 75 mg. and then the amount is reduced to 50 mg. for the next two doses and then 25 mg. for each of the succeeding doses until a total of 500 mgs. is reached. The interval between injections is usually seven to ten days but the chief guide to dosage and interval is the blood examination.

The reaction to the treatment is variable—it may be local or general or both. Usually the patient complains of pain at the site of the tumor within a few hours after the injection and this pain may be accompanied by swelling and edema. The general reaction affects the blood and blood forming organs with the pro-

duction of anemia and stippling and there may be more or less disturbance of the gastro-intestinal tract (chiefly colic) and of the liver (icterus) and kidney (albuminuria) and suppression of the urinary output.

Blue line on the gums is rather rare.

Toxic effects on the central and peripheral nervous systems are extremely rare.

The anemia produced by the lead is treated by injections of Iron Arsenite and when necessary, by blood transfusion. In severe colic morphin and atropine are used.

The results of treatment are not startling, except in isolated cases, but I believe are encouraging considering the class of cases treated. Since November, 1920, until November, 1925, 227 cases received treatment and these may be tabulated as follows:

FATE OF PATIENTS, NOVEMBER 9, 1920, TO NOVEMBER 9, 1925

Died before treatment could be completed	50
Died of intercurrent infections	3
Died after treatment (including 2 deaths from acute nephritis, the result of lead poisoning)	106
Died as result of extensive destruction of growth by lead	4
Too recent for results to be estimated	14
Complete treatment refused, but patients are living normal lives	9
Disease completely arrested	10
Believed cured and treatment stopped	31
	227

The percentage of success is, therefore, about 20 per cent. and considering the class of cases treated this is considerable.

With improvements in methods which surely will come, with the improvement in class of cases treated which will be justifiable only when the dangers of the treatment are removed, with the employment of lead therapy in conjunction with other well known and reliable methods of treatment such as surgery, electro-coagulation and x-rays and radium I am convinced that lead will come to occupy a definite and accepted place in our list of weapons against this disease.

For the present, certainly, its use is limited and as in the case of x-rays and radium over-enthusiasm has no place. The promiscuous injection of lead into patients' veins without proper study and care can only cause harm and react against a treatment that has limited but definite value.

Lead has been shown by Blair Bell clinically and by Frances Carter Wood experimentally on rat tumors to have a destructive effect on cancer cells.

X-rays and radium have long been known to possess similar properties.

A combination of the two should produce better results than either one alone; in fact, in the present state of our knowledge, lead may very properly be considered a useful adjunct of radiation and surgery.

BIOGRAPHY

1. W. Blair Bell; Brit. Med. Jour., November 20, 1926.
2. W. Blair Bell; The Lancet, November 14, 1925, Page 1003.
3. Lewis, W. C. M.; Brit. Med. Jour., Nov. 20, 1926.
4. Cunningham, L.; Brit. Med. Jour., Nov. 20, 1926.

DISCUSSION

Dr. E. G. C. Williams, Danville: The question is often asked, "Well, doctor, what is the cause of cancer, and what is the cure for it?" My answer to that is, "If I could answer that question, within twenty-four hours they'd drag the Statue of Liberty down off its pedestal and be erecting one there for me."

It is the biggest thing we face. It is the darkest subject in medicine and a thing upon which more work is being done than any other branch. When anything like the lead treatment comes to the surface, we grasp for it and we want to learn all that we can about it. So much so that Dr. Pettit goes to Liverpool, really with this idea of investigating the lead treatment.

We feel certain that the cause of cancer does not lie within the realm of bacteriology. We know that certain ones occur from irritation or at the point of irritation, yet many occur where there is no irritation at all. We have previously described cancer as a bolshevik uprising of certain body cells which throw off the controlling government of the body and start a localized government of their own, and as all such governments do, soon get to fighting among themselves, crowding each other out, and undergo central necrosis.

We have certain agents which we are using against cancer. We know that the ideal is complete removal of the entire process and its surroundings. Most cancers could be cured this way if taken early enough, but as we see them, most of them are beyond this stage. We are aiming at them, therefore, treatments have have a chemical or physical effect—our x-ray and radium—and now we add to this the possibility of lead.

I feel extremely hopeful that our future in cancer treatment will be along the physial-chemical lines.

Yesterday Dr. Grote gave us something to think about in his talk on the fluorescence of certain body cells under certain conditions. Today we have from Dr. Pettit this talk on the influence of lead on these cancer cells. I have certainly enjoyed what Dr. Pettitt has said and will leave within a few days to check up in Liverpool just what he has been telling us. I

hope to come back with even more than he has given us because I have that to start on.

In this country there is, down at Harvard, Dr. Lawrence Ferhall, a boyhood friend of mine, who, has been working for years on the chemistry of lead and on lead poisoning. I believe that Lawrence Ferhall is the man who can help us in this country on the chemical side of this treatment. I go skeptical, even as I know Dr. Pettit went. I hope to come back with a feeling that we are possibly arriving at something that we can use. It is merely another little tug at the curtain that is hiding the real scene from us.

Dr. Harold Swanberg, Quincy: The thought went through my mind as Dr. Pettit read his paper that there is no doubt that carcinoma cells are sensitive to lead and I am wondering whether Professor Blair Bell had made any observations of studying the incident of cancer among workers in lead.

We have a large number of occupations in this country in which there are many workers in lead. These men have received small doses of lead for a good many years. Some of them have lead colic from time to time. Has this prophylactic treatment with lead had anything to do with reducing the incidence of cancer among such individuals? I think it would be very interesting to know concerning this.

I appreciate the fact that most radiologists have had very little experience with the lead treatment of cancer on account of the difficulty of securing a staple preparation. I am sure Dr. Pettit will be glad to answer any questions.

Dr. H. W. Grote, Bloomington: The question of lead poisoning brings to mind a case that was presented to me about three or four years ago—a case of lead poisoning that had some sort of a lesion in the eye. It was thought by the referring physician that there was a malignancy. That case received one x-ray treatment—I don't know now how much—but we had a terrific reaction, so much so that I never saw the patient again. The patient saved me from a malpractice suit, I think, by conveniently dying about three weeks later.

Along about that time Dr. Magnuson of this city took me out to see a patient who worked in some foundry and that patient underwent several exposures for the making of some radiographs and that patient sustained a very severe erythema. Dr. Magnuson wrote me and asked me if I thought we were up against a burn proposition. Radio-dermatitis, not burn! He was worried considerably, and although I had nothing to do with it excepting as an innocent bystander, I came up here to see that patient again.

These things just occurred to me as Dr. Pettit was reading his paper.

I have learned since yesterday that there is a lot of work going on at Johns Hopkins in the experimental physiological laboratory on the fluorescence of abnormal tissue. I didn't know that before, but I just heard it, and particularly as regards malignancy.

Dr. J. S. Archibald, Decatur: I would like to ask Dr. Pettit if they are using any other method in conjunction with the lead; e. g., x-ray or radium.

Dr. R. T. Pettit, Ottawa: I went to Europe not only for the purpose of going to Liverpool but for making a visit to a number of the European clinics. But my main reason for going at this time was to visit Liverpool. I wanted to see what kind of men they were, what kind of work they were doing, whether we should believe them or whether we should not. If you see a man face to face and talk to him, you can form a much better opinion of him than you can by reading some articles that he has written. I think we all feel this way.

My impression, after visiting Liverpool, was that Blair Bell is a man of unusual scientific attainment, of the very highest ethical standards and a man of unquestioned honesty.

I would like to cite a case I saw being treated at a clinic; a case of carcinoma of the nasal pharynx that had received one dose of lead and had the whole carcinomatous mass degenerate and necrose and slough out. I looked into the nasal pharynx three weeks after the injection and it appeared smooth and clean where the mass had sloughed out.

The man had complained after his treatment of terrific pain in his head and particularly in the back of his throat. This proved to me as much as anything else that carcinomatous tissue is affected by the intravenous injection of lead.

With regard to Fairhall and Minot of Harvard University, they have done a masterly piece of work on industrial lead poisoning and if any of you wish to undertake this method of treatment you most certainly should have Fairhall's book, because he has done more and better work on this subject than almost anyone I know.

With regard to workers in lead, that matter has been investigated and it has been found that the incidence of carcinoma in lead workers is less than normal.

How does this lead act? Has it a toxic effect upon the carcinoma cell? Blair Bell believes it has. The carcinoma is like chorionic epithelium, and with an increased permeability of the cell membrane, an increased content of phosphatid, the lead is attracted to and gets into the cancer cell, combines with the phosphatids and produces a toxic effect resulting in necrosis.

Francis Carter Wood believes the effects of lead are due to thrombosis of the blood vessels in the tumor. Other people are of the opinion that the small radioactive properties of the lead may have something to do with its action. Of course you remember lead is the end product of radium. How do we know but that lead still possesses a small amount of radio activity?

With regard to combination of lead with other methods, let me say this. Blair Bell had to prove that lead was of value. He has done that. We do not need to go over that again. That is proved. Clinical results also show what can be done with lead alone.

We know what we can do with x-rays, and radium alone. We know what we can do with surgery alone. It would be unreasonable now to try to treat cases with lead alone and neglect our other good methods of treatment. At Liverpool at the present time they use surgery, electrical coagulation and x-ray as well as lead when indicated.

What better results are we going to get with intravenous injections of lead? We do not know but I fell that the outlook is reasonably hopeful for better results, particularly in hopeless cases.

With regard to the use of other metals, experiments have been made on tissue cultures, upon living plants, upon animals and upon human cases and it has been proven quite satisfactorily that these properties are possessed by lead and no other metal. Copper, platinum, tin and several others have been tried out, but have been found to be of no value.

With regard to irritation, Blair Bell believes that irritation makes it more difficult for the normal cells to get nourishment, and these cells revert to an ancestral type, seeking means of living, seeking nourishment, and the result is they revert to a type of cell that has many of the similarities of the cells in the chorionic epithelium. This was his starting point in working out his problem. He later found the chorionic epithelium susceptible to the toxic effect of lead (producing abortion in pregnant animals) and from this reasoned that possibly the cancer cell would also be susceptible to the toxic action of lead.

CHRONIC GLAUCOMA*

WILLIAM H. WILDER, M. D.
CHICAGO

Glaucoma, particularly in its chronic forms, is one of the most insidious conditions that confront the physician. Because of this insidiousness and the complexity of its pathology it is one of the most important and interesting conditions that the specialist in ophthalmology meets.

In its acute form it presents features that should be recognized by the general physician, but frequently are not, while in its early and simple form too frequently it escapes the attention even of the specialist.

Because of the importance of early recognition of the condition at a stage when proper treatment may be of some help in checking its advance, I have ventured to suggest the subject for this program, hoping the discussion of its various phases may be mutually helpful.

In the first place, glaucoma is not a disease entity, as its description in some of the books would imply, but is an abnormal condition or syndrome whose most important and essential feature is increased intraocular pressure or hypertension of the eyeball.

The division into inflammatory and non-inflammatory, acute, sub-acute and chronic or simple forms is the natural sequel of considering the condition as a disease and is confusing. Much to be preferred is the simpler nomenclature of congestive and non-congestive forms adopted by Elliot and other writers on the subject.

Clinically we divide glaucoma into primary and secondary forms. We regard as primary those cases in which the condition seems to develop without any preceding disease or injury. Secondary are those in which the condition comes on in the course of some obvious disease or injury. It is more than likely that in a strict sense all cases of glaucoma are secondary inasmuch as they follow or are caused by abnormalities of circulation or secretion within the eye that interfere with proper drainage and so lead to increased intraocular pressure.

More refined methods of examination and testing tend to establish the correctness of this, but for reasons of convenience we may still adhere to the old classification of primary and secondary as stated above and either of these may be acute or congestive, chronic or non-congestive.

As mentioned before, the prominent, indeed the essential feature of glaucoma is hypertension or increased intraocular pressure without which, according to some, there can be no glaucoma.

This would seem to reduce the problem to one of hydrodynamics and preservation of equilibrium of pressure. Most of the signs that we observe in glaucoma can be explained by the increased pressure or hypertony. The cupped optic disc, the peculiar and characteristic contractions and abnormalities of the visual fields, and in more advanced cases, the shallow anterior chamber, the sluggish, partially dilated pupil, the venous congestion, the impaired accommodation, the steamy and insensitive cornea, the rainbow phenomena, with all of which we are familiar, can be brought about by the hypertension. But the problem is more complex than this and involves the mechanism of secretion and excretion of fluids in the eye, and in this we have to reckon with osmotic pressures, transu-

*Read before the Section on Eye, Ear, Nose and Throat, Seventy-eighth Annual Meeting of the Illinois State Medical Society, Chicago, May 9, 1928.

dation of serum from the capillaries, biochemical processes that may change the character of the fluids, and obstruction of outflow through the lymphatic and venous channels.

The mechanism for the production of the intraocular fluids and the maintenance of the normal intraocular pressure present a problem that is still unsolved.

Several rather conflicting theories are held by different observers. One of the most widely accepted is that known as the *secretory* theory which finds earnest advocates, among others, in Collins of England and Seidel of Germany. According to this the aqueous is secreted from glandlike structures in the ciliary body and Collins in bleached sections claimed to have demonstrated the presence of these glands, but observers such as Alt, Greef, Griffiths and others have disputed the correctness of the interpretation and think they lack the glandular structure and lumen that true glands would have.

The *transudation* theory holds that the aqueous humor is formed by transudation of the serous elements of the blood from the capillaries, chiefly of the ciliary body and to a less extent of the anterior choroid and iris. This fluid then circulates through the eye, partly into the vitreous by diffusion through the hyaloid membrane but more into the posterior chamber, then through the pupil into the anterior chamber, finding an exit into the canal of Schlemm through the spaces of Fontana in the pectinate ligament.

Both these theories assume a difference of pressure between the vitreous and anterior chambers to account for the forward current, but according to some critics who dispute the correctness of the idea that there is such a forward circulation of the aqueous, no demonstration of such difference in pressure in normal eyes has been made. (Hamburger, Magitot, Duke-Elder.)

The theory of *dialysation* holds that the intraocular fluids (aqueous) originate by a process of dialysis from the blood of the capillaries, predominantly of the ciliary processes, possibly in part of the iris, the dialysing membrane being the capillary walls.

Recently Duke-Elder in a monograph on "The Nature of Intraocular Fluids" in which are described elaborate physico-chemical experiments and observations, supports this theory. He thinks there is a "continuous process of reciprocal exchange on either side of the capillary walls, determined by the difference in hydrostatic pressures; an osmotic flow in the opposite direction conditioned by the relative osmotic pressures, a diffusion out or in of the diffusible substances according to their differences of concentration."

This theory has evolved from the views advocated by Hamburger that no circulation of fluids takes place in the eye, but that its metabolism is carried on by a process of cellular interchange.

Duke-Elder thinks that "the existence of a circulation such as described by Leber cannot altogether be denied, but that the aqueous is practically without circulation under normal pressure conditions, although circulation to a minimal degree may be imposed upon it secondarily. Such a circulation in mass might be brought about by contractions of muscles of the eyeball. He speaks of it as an ebb and flow throughout the eye with a tendency towards diffusion from the iris and ciliary body to the angle of the anterior chamber.

Causes of Glaucoma. A knowledge of pathological anatomy assists in the study of pathogenesis. In this subject, the lack of material in the earliest stages of glaucoma increases our difficulties. Most of the glaucomatous eyes that come to section are those in the latest stages and we cannot be sure that the conditions found are those of cause or effect.

I assume we are all familiar with most of these changes. The shallow anterior chamber, the filtration angle blocked by the root of the iris, the atrophied iris, the swollen ciliary processes, the edematous steamy cornea, the engorged ciliary vessels, the cupped optic disc, the cavernous atrophy of the optic nerve are some of the signs that are observed either during life or after section of the eyeball. But it is difficult to answer the question: "Are these the cause or the effect of the increased intra-ocular pressure?"

There is little doubt that age is an important factor in the etiology. It is a common observation that most cases of glaucoma occur in middle and late life and statistics confirm this. For instance, in the analysis of a series of 1,032 cases of primary glaucoma Haag found that 4 occurred in the first decade of life, 10 in the second, 26 in the third, 74 in the fourth, 176 in the fifth, 288 in the sixth, 329 in the seventh, 116 in the eighth and 3 later.

These figures are in accord with the observations of Priestly Smith on a series of 1,000 cases collected from the practice of a number of surgeons. But in what way does age influence the intraocular pressure? Priestly Smith has shown that the lens grows larger with advancing life while the size of the eyeball remains the same or possibly becomes somewhat smaller. He claims to have demonstrated that the ciliary processes are more prominent and bulky in the old than in the young. Because of this increase in size of ciliary processes and lens, the circumlental space is narrowed so that fluids cannot so readily pass from the vitreous into the aqueous chamber. In consequence the lens and swollen ciliary processes are pushed forward against the iris, the root of which blocks the filtration angle and thus impedes or stops the outflow of fluids through the spaces in the pectinate ligament. Of course this would explain the shallow anterior chamber which is one of the well recognized signs of an established glaucoma.

Thickening or sclerosis of the fibers of the pectinate ligament as pointed out by Henderson may contribute to this result. In consequence of such thickening, which may be one of the manifestations of fibrosis incident to advancing life, the lymph spaces in this structure may be so contracted as to interfere with the flow of fluid through them into the canal of Schlemm.

Valuable as is the knowledge of these factors in the production of glaucoma the ultimate cause is not yet known. What brings about the enlargement of the ciliary processes? Is such an enlargement in the nature of an inflammatory condition and is there associated with it an increased secretion of fluids which the circulatory system of the eye is unable to take care of, thus raising the intraocular pressure? This condition would seem to explain certain cases of glaucoma, not infrequent, that come on in the course of low grade anterior uveitis, probably cyclitis, in which we can see with the slit lamp and sometimes without it signs of inflammation in the iris and ciliary body in the form of small particles of exudate in anterior chamber, or on the lends capsule or posterior surface of the cornea.

In such cases the character of the aqueous must be changed and it must have a higher albumin content that will impede its flow through the various channels. In such cases the anterior chamber may be deep, and the filtration angle not blocked by the root of the iris. Such cases suggest the thought that many cases of glaucoma instead of being primary are secondary to some underlying conditions that a more refined examination might disclose.

What role do vaso-motor disturbances and nervous irritations, so common in the period of life when glaucoma occurs, play in the problem?

It is commonly observed that grief, anxiety and worry act as exciting causes of attacks of glaucoma. These emotional disturbances probably occasion alterations in the venous blood pressure and so may influence the quantity and character of the fluids entering the eye from the capillaries. The excitement caused by an operation on one eye may precipitate an attack in the other.

Do degenerative changes in the uveal tract, particularly in the ciliary body, bring about increased or altered secretions in the eye? What influence do various morbid conditions that result in auto-intoxications or infections have in bringing about such degenerative changes in the ciliary body?

These and similar questions are engaging the attention of students of the subject and have not yet been satisfactorily answered, associated as they are with some of the most intricate problems of metabolism. In this connection the words of Risley are worth recalling: "Glaucoma is a disease coming on at an age when wear and tear, harassing vicissitudes, misfortunes, exposures, overwork and vicious living have sapped the physiologic foundations of life; when infections have found entrance to the structure of the organism through the doorway of the epithelium; and when a variety of toxic autointoxic and other influences have set up vascular and cardiovascular disease, associated nephritis, uveitis, high blood pressure, etc. Glaucoma, in fact, rarely occurs in individuals in good general health."

DIAGNOSIS OF CHRONIC OR NON-CONGESTIVE GLAUCOMA

In the non-congestive forms of glaucoma, problems of diagnosis are present that are more difficult than those in the more advanced or congestive forms. This is notably the case in so-called simple glaucoma in which the intraocular pressure is not at all times measurably increased. These are the cases that frequently puzzle us in

diagnosis and raise questions as to treatment. Frequently they present little or no impairment of central vision; the onset of increased intraocular pressure has been insidious and its progress slow. The first intimation of anything wrong may be the discovery, in the routine examination, of a cupped disc, and then further examination elicits the glaucomatous condition. Or the patient may complain of dull pain, again of neuralgic pains in and around the eyes at times, blurring of the vision when reading as if his glasses do not fit. Such symptoms may indicate disturbances of accommodation from congestion of the ciliary body, or disturbance in the refractive power of the lens from increased pressure. It may occur in myopes as well as hyperopes.

Probably in these cases of so-called simple glaucoma the increase in tension is not constant, but intermittent. Before the days of more accurate testing of tension with the tonometer, there was question as to whether many of these simple glaucomas manifested any increased tension, it being too slight to be noted by digital examination, but careful tests with the tonometer reveal that, at times, increased tension exists.

It is in such cases that we must arrive at the diagnosis by the study of visual fields, the central vision, the appearance of the optic disc and a record of the tension as taken with the tonometer at various times.

The fields for white and colors should be taken not once but frequently to record the progress of the case. They should be taken by the same observer each time, and as far as possible under the same conditions as to light environment. background, etc., for there is no examination that admits of a greater chance for error on the part of both patient and observer than a perimetric examination of the visual fields.

We are all familiar with the various irregularities and contractions of the fields that are present in simple glaucoma, but certain features stand out prominently enough to make definite characteristics. The contraction of the field is usually, though not invariably, found on the nasal side. It may be more marked above or below, depending upon the pressure upon the optic nerve. It is my opinion that the position and shape of the physiologic cup, whether central or temporal, may determine, in the beginning, the character of the shrinking of the visual field. It is well, therefore, to record in our histories, in routine examination of cases, a brief description of the position, size and depth of the physiologic cup for future reference and comparison.

As we know, the optic disc is the site of a foramen in the sclera and choroid bridged across by the lamina cribrosa, through the openings of which pass the bundles of fibres of the optic nerve. Fibers that emerge at the nasal side of the optic disc spread out to form the nasal half of the retina, the so-called "nasal fan." The papillo macular fibers proceed from the temporal half of the disc occupying a sector that has about one-third of the circumference of the temporal side of the disc, and supply an elliptical area that includes the region of the macula.

Curving above and below these fibers are others that emerge from the upper and lower temporal side of the disc and supply a larger elliptical area in the temporal half of the retina; those from above meeting those from below in a central horizontal raphé. These are called the superior internal and inferior internal arcuate fibers and the superior external and inferior external arcuate fibers, the latter external group supplying areas of the retina more temporalward than the former internal group.

Pressure upon these arcuate fibers that supply the temporal side of the retina accounts for the limitation of the field on the nasal side and with the increasing tension and the greater cupping of the optic disc the more marked will be the defect.

Unequal damage by pressure on the arcuate fibers above or below brings out the valuable sign known as "Roenne's Nasal Step" either at the upper or lower part of the nasal field depending upon whether the upper or lower bundle is most compressed. If these arching fibers are evenly pressed at the upper and lower margins of the disc there will be an even contraction of the nasal fields. If the bundle at the upper part is more compressed than at the lower side the contraction of the corresponding nasal field will show a well marked boundary, like a step, running along the horizontal raphé.

This sign can be elicited with large object perimetry by carefully passing the target back and forth for a few degrees over the horizontal nasal meridian.

Bjerrum pointed out that in early glaucoma

there develops a scotoma beginning at the blind spot and sweeping around the fixation point either above or below producing an arcuate, or in extreme cases, an annual scotoma. Sidel has described similar scotomas, winglike extensions of the blind spot, sickle shaped with their concavity toward the fixation point. To chart these defects small objects of 1 mm. or 2 mm. must be used either on a Bjerrum screen or with the excellent instrument devised by L. C. Peter, the campimeter. Lloyds' stereocampimeter is even more useful in cases that have binocular single vision. These signs furnish valuable testimony in the diagnosis of early glaucoma.

Sooner or later if the glaucoma progresses the blind part of the field is found to be in contact with the blind spot of Mariotte as first pointed out by Bjerrum.

With the continuance of the intraocular pressure the contraction of the visual fields proceeds until final blindness is reached. The color fields usually contract concentrically with the field for white, but atrophic processes in the optic nerve may alter the rule.

Tonometry. In simple glaucoma the pressure may not be great but it may be continuous. In some cases it may not be continuous, but may be intermittent.

One should be able to determine with a fair degree of accuracy the hardness of the eyeball from its compressibility and so be able to say whether the intraocular pressure is normal or abnormal. Formerly, ophthalmologists relied upon digital palpation for this purpose, but the modern tonometer enables us to get more accurate results than can be obtained with the fingers. Every ophthalmologist should have a reliable tonometer and should be skilled in its use; it is as important in his work as is the blood pressure apparatus in the work of the general physician. Not that he should neglect acquiring that skill in palpation that will tell him at once that the tension is normal or distinctly abnormal, which he should constantly use, but that he may have a more accurate measure of the tension than the fingers alone can give. Furthermore, a record of observations can be made so that comparisons can be made from time to time as to the condition of the pressure which could not be so well done with digital examinations.

With any form of tonometer errors may arise from inaccuracy of technic, and with any of them, however carefully calibrated they may be, there will be variations in results arising from such conditions as rigid or flaccid cornea, slight keratoconus, high astigmatism regular or irregular, corneal scars, etc. It may or may not give us an accurate reading of the intraocular pressure in terms of millimeters of mercury, but it will from day to day or week to week, if properly used, give us on the same patient the relation of impressibility of the eye to intraocular pressure.

My preference is for the Schiotz instrument because of its lightness and accurate construction. The patient should be lying flat on the back, so that the face may be in the horizontal position. One per cent. holocain or butyn solution is used to cause anesthesia of the cornea. The patient is asked to fix some object on the ceiling so that the plane of the base of the cornea may be as nearly horizontal as possible and the instrument can be placed exactly vertical on the cornea, the foot plate occupying the exact center of the cornea. Failure to do this will give inaccurate readings. I have noticed that two may work together to good advantage, one holding the instrument and keeping the patient's gaze in the right direction, while the other takes the reading.

The instrument should be frequently tested on the artificial metal cornea to make sure that the indicator arm registers accurately at zero on the scale. The instrument must be kept in perfect condition so that the plunger glides easily.

Numerous observations seem to show that the normal limits of pressure seem to be between 15 mm. and 26 mm. on the Schiotz scale, but there may be individual cases where 28 mm. or even 30 mm. is normal.

TREATMENT

In the treatment of glaucoma we are confronted with the difficulties that arise from our lack of definite accurate knowledge of the etiology. Assuming the correctness of the statement of Fuchs that "genuine glaucoma develops only in an eye which has a predisposition to it," the question arises: What constitutes such a predisposition? If we knew exactly we should be on the way toward a rational prophylaxis. Lacking such definite knowledge we are forced to rely on therapeutic measures that are largely empirical.

Most of these measures aim at combating conditions that are supposed to influence the development of glaucoma. In general they are reasonable, for they include avoidance of excesses in eating and drinking, avoidance of worry, hurry, prolonged hours of work and exhaustion, etc., etc., directions not always easy for certain patients to follow.

Probably a reasonable amount of reading in short time periods is not injurious to the patient with non-congestive glaucoma, for the contraction of the ciliary muscle might promote the pumplike action of the scleral spur of Thomson and thus encourage the flow of fluids into the Canal of Schlemm. As to local therapeutic measures they are all directed toward the increased intraocular pressure and are intended to promote drainage from the eye. Myotics such as eserin and pilocarpin are unquestionably efficient to a certain extent. The salicylate of eserin seems preferable to the sulphate, for it seems less irritating, and for continuous use in simple glaucoma, pilocarpin muriate or nitrate is to be preferred because of its less irritating effect on the iris. The stretching of the iris from the marked contraction of the sphincter must draw the root of the iris away from the filtration angle and allow better circulation through that part. For the same reason the crypts and spaces of the iris are opened up, and probably are better able to absorb fluids from the anterior chamber.

One of the most important problems of treatment is that concerning operation, and particularly in non-congestive or simple cases. In congestive cases the evidence is clearer, for the accumulated experience of the masters in Ophthalmology from Von Graefe down to those of modern times speaks loudly in favor of operation to control the increased intraocular pressure.

The debate waxes warm at times in regard to which method has the greatest value, and iridectomy still seems to have the best of it, but there seems to be little dissent from the view that some operative measure is necessary to bring about an artificial drainage.

It is different in the case of simple or non-congestive glaucoma. Here we have a condition that does not present the immediately dangerous features of the congestive type, and there are those whose experience and skill are great who maintain the inefficiency of operation and rely upon the power of myotics and general measures to maintain the proper equilibrium.

How are we to direct our way in the midst of such disagreement? It seems to me that the study of our cases by means of the tonometer and the visual fields must furnish the guide. It may not be amiss to refer to my own rule of practice in such cases.

If the case can be controlled and general treatment and regular applications of pilocarpin will keep the tension within normal limits, if the contraction of the fields does not continue, the central vision remaining normal, operation is not urged, but the patient is informed of the importance of regular observation of the case and religiously regular treatment. My observation is that cases that can be controlled in this way are few. If, in spite of general treatment and regular use of myotics, the records of the tonometer show increased tension at times, even if not great, and the fields slowly contract, or show enlarging scotomas, even if central vision is normal, operation is advised and urged, the patient, so far as his intelligence will permit, being made acquainted with the condition and its dangers.

The operations that have been proposed and championed for chronic glaucoma are so numerous as to indicate that the perfect one has not yet been devised. Iridectomy, which seems to be so efficient in acute congestive cases, seems much less efficacious in the simple form, and hence the variety of fistulizing and other operations that have been proposed. The operation of LaGrange has its strong advocates and is doubtless valuable in that it combines the iridectomy with a sclerotomy. Cyclodyalysis has had its day but has failed to retain much favor.

Trephining when properly performed, probably yields as good results and as permanent as any, and the same can be said of the iris inclusion operations such as iridotasis and iridencleisis. These latter operations produce the least traumatism of the eye according to my experience and their merits should be carefully considered in deciding on the method of operation. in spite of the prejudice against them in the minds of some surgeons. In any eye operation skillful technic is an essential factor for success and this applies particularly to operations for glaucoma.

122 S. Michigan Blvd.

DISCUSSION

Dr. Harry Gradle: I saw Dr. Goldenburg's paper

some weeks ago and it was not the paper on which he talked today, and I am sure he is going to rewrite it before he publishes it The question of acute inflammatory glaucoma is not one that engages our attention as much as the non-inflammatory or so-called simplex. In the first place, we see but few cases of acute glaucoma. In the second place, they are immediate, urgent cases and have to be dealt with in a hurry. We are either completely successful or completely unsuccessful. There seems to be no middle course. However, the continual burden is the simplex type. Last year I spoke of the use of the newer preparations in connection with treatment, adrenalin and glaucosan. Let me add to last year's report after having one year's very active experience. My work has been confined to adrenalin, omine-glaucosan and links-glaucosan. Adrenalin has been covered in the literature. Amine-glaucosan is an extremely powerful mydriatic to be used in the form of instillations in the acute inflammatory glaucoma. It has not proven successful in my hands. In a few cases I have had results—in the larger number I have had absolutely no results. The effects are not comparable to adrenalin and here, too, the effects are limited to the cases where anterior adhesions of sufficient density have not been formed. In chronic glaucoma I believe the adhesions are too firm to allow medicinal treatment to be of value. In glaucoma simplex I believe we have a very valuable aid in links glaucosan. It is by no means a cure-all. It is merely a valuable adjunct to lift us over the rough spots that we encounter in our treatment of glaucoma simplex. We should never start a patient on links glaucosan. They should be started on the general treatment Dr. Wilder has outlined. But when we come to a point where we cannot control the tension with that treatment, then call in links glaucosan, and almost invariably the tension of that eye will be reduced to normal or even subnormal point. The reduction is temporary, but it gives the eye a chance to recuperate and allow the medication to take a fresh hold and there are many cases in which we have been able to carry on by medication alone, aided by links glaucosan, which certainly would have come to operation. Personally I prefer not to operate upon a simplex provided the triad of symptoms can be controlled —the tension, the fields and the vision. As long as this triad can be held in statu quo by medicine operation is contraindicated, but when they begin to slip we must consider operation, and in these cases where they are beginning to slip links glaucosan has proven to be of value. If the slippage is great and the case goes on, links glaucosan will not put off operation by any means; but it will help, in those cases that can be controlled medicinally, and in those who have stepped beyond the border line. I recommend it to your use, and I believe you will be able to carry on a good many cases of glaucoma simplex without operation with its aid, which otherwise would have to come to operation with the questionable results that we look for.

Dr. Thomas Faith: It is my impression, after rather long observation, that we seldom if ever see a case of acute glaucoma. Of course, we see cases of acute disturbances with elevation of tension, but are these cases of acute glaucoma? I have in my records the histories of something over twenty cases of acute hypertension with inflammatory symptoms which have been cured without myotics or an eye operation. None of these cases had any previous history of glaucoma or of a prodromal stage. These were all cases of low grade uveal inflammation and were treated with mydriatics and general measures directed toward the cause, which was usually, if not always, found to be septic. I believe the so-called acute glaucomas that are true glaucomas, in which the subsequent history bears out the diagnosis, are in fact acute exacerbations of a chronic glaucoma, and further, I believe if the history of these cases could be obtained there would practically always be a history of a prodromal stage. Fuch's statement which has been quoted by Dr. Wilder seems to me to bear out the above opinion. To me it seems that we have two types of glaucoma—chronic glaucoma without congestive attacks, and chronic glaucoma with acute congestive attacks, and these two conditions may be one and the same thing, under different circumstances, the one type lacking the factor or factors which precipitate the acute congestive attack. What the exact etiology of the disease is has not been determined, as both Dr. Goldenburg and Dr. Wilder have said. Anatomical conditions may predispose; changes in the blood chemistry through toxic metabolic processes or through disturbed endocrine balance may be either the predisposing or precipitating factors, acting through the blood and lymph circulation in a manner we do not understand. We do know that glaucoma seems to be a problem in edema, but further than this we have apparently not arrived. I am inclined to believe that a particularly careful inquiry into the previous history will help us very much in separating these cases into those which we recognize as real glaucomas, and those which are cases of uveal disturbances with increased tension; and to be sure, we must use every possible means at our command to rule out the presence of uveitis before labeling a case one of glaucoma. I believe the time will come when the term glaucoma will be discontinued. It is a misnomer, it has no descriptive significance and serves only on account of its long usage. The use of the term serves only to indicate the existence of increased intraocular pressure, which is a symptom and not a disease.

THE COMMON DRUGS USED IN THE TREATMENT OF SKIN DISEASES AND THEIR ACTION*

JAMES W. SKEBELSKY, M.D.
CHICAGO

Grace, rotundity, character and facial expression all contribute their part to beauty of person. However, the elegant superficial finish so essen-

*Read before South Chicago Branch Chicago Medical Society, March, 1928.

tial to the favorable first impression is furnished by an attractive, healthy, wholesome skin, which is perhaps the one most indispensable prerequisite to pure physical beauty. The old saying that "beauty is only skin deep," speaks volumes in a complimentary way for the epidermal covering of those whom the gods have favored with pulchritude.

To the laity the dermatologist was formerly known as a beauty specialist. It is only in recent years that he has lost his "beauty," but has retained the art of diagnosing all forms of dermatoses and the skill of treating same in a satisfactory manner. With the general practitioner the proverbial expression so frequently uttered: "It is or it is not eczema," has fallen into oblivion and is now mentioned only as a reminiscence of how poorly he was then trained. The recent graduates, however, are very well equipped to recognize all common skin diseases, but are somewhat perplexed as to what form of treatment to apply, and for that reason I shall endeavor in my discourse to review some of the common drugs used in the treatment of skin diseases and explain their action.

The treatment of skin diseases is both internal or constitutional and external or local. In some instances both internal and external medication may be indicated; in others, one or the other. A generation ago many of the disciples of the older dermatologists argued much in favor of the employment of external measures only, no matter what the nature of the disorder might be, but time and experience have demonstrated the frailty of their reasoning and it is now generally recognized that the purely local cutaneous maladies are few and far between. In many instances constitutional treatment is needed more for the purpose of increasing the bodily resistance of the patient than for any direct or specific effect it may have on the causative factor. Constitutional remedies may be grouped into three classes: 1. Hygienic measures; 2. Indirect medicinal agents, and 3. Direct medicinal agents.

From the standpoint of prophylaxis the first of these is by far the most important. Properly selected food, thoroughly masticated, moderate exercise, plentiful amounts of pure soft drinking water, sunny living rooms, well-ventilated sleeping quarters, abstinence from alcohol, tobacco and coffee all tend to promote the good health and the general wellbeing of any individual. The nearer we approach this ideal state of affairs the more successful we shall be in combating the physical disabilities, cutaneous and otherwise, of our patients. The average person eats too much food of high caloric value, takes too little exercise, and drinks too little water, and therefore, becomes an overheated human furnace subject to explosions. However, to lay down hard and fast rules regarding exercise is somewhat difficult. The majority of us recall with a smile the experience of a distinguished colleague who advised a new patient that all he required was a moderate amount of vigorous exercise, only to discover later that his patient was an instructor in physical training. Alcohol is detrimental in practically all cutaneous disorders, and tobacco, coffee and tea, even in moderate amounts, are apt to do harm, and seldom, if ever, do good. There are no specific drugs in the treatment of skin diseases, but when properly used some of them act almost like a specific. Under the heading of internal treatment I shall mention the following remedies which work admirably: cathartics, alkaline diuretics, salicylates, quinine, arsenic and its compounds, mercury and its compounds, iodides, bromides, and adalin-luminal.

Cathartics and Alkaline Diuretics. In the majority of acute congestive disorders of the skin the use of both cathartics and diuretics is indicated. The saline preparations, particularly magnesium sulphate, and citrate, and sodium phosphate are very valuable. The former is best administered in small amounts of water sweetened with glycerin and flavored with lemon juice, and given on an empty stomach. In chronic constipation so common in women, and in men of sedentary habits, nothing is so satisfactory as cascara preparations, and particularly cascara evacuant. Russian mineral oil, which acts principally as a lubricant, has met with wide popularity in this country. Of the alkaline diuretics, sodium citrate and sodium acetate are probably the best. The use of fancy vehicles in compounding these prescriptions should be obviated, when ordinary peppermint water will answer the purpose.

Salicylates. In the salicylate group I find salol particularly useful in many cutaneous disorders associated with intestinal fermentation.

It is of special value in the forms of pustular acne where patients have an habitually coated tongue, a foul breath and defective digestion.

Quinine. Quinine is largely employed in cutaneous medicine for the generally recognized systemic effects, and if continued for any length of time it imparts to the skin a peculiar velvety feel, the latter disappearing on withdrawal of the drug. It is particularly useful in the treatment of dermatitis exfoliativa of the idiopathic type. When continued for a long period, be on the lookout for cinchonism. The forms of the drug commonly used are quinine sulphate or bisulphate.

Arsenic. This drug not only possesses the properties of a general tonic when taken internally, but also exerts a specific action on the epithelial layers of the integument, and the continued use of it may lead to over-stimulation of nutrition to the development of epithelial changes, which may foster if they do not actually incite, malignancy. The most common effects after the prolonged use of arsenic are diffuse or circumscribed pigmentation, with or without hyperkeratinization, erythema, desquamation or atrophy. Arsenic is particularly indicated in psoriasis, pytriasis rubra pilaris, pellagra, granuloma fungoides and sarcoids. Some patients have an intolerance for the drug, and it is always well to commence with small doses. When administered by mouth it should be taken after meals well diluted, in ascending doses. Newer arsenicals such as arsphenamine, sulpharsphenamine and neoarsphenamine possess specific spirillicidal properties and are therefore indicated where spirilli are the offending organisms.

Mercury. The mercury preparations are particularly valuable in the treatment of syphilis and lichen planus. In the latter disorder they constitute the most potent remedy at our disposal. Although most commonly employed in the form of protoiodide by mouth, mercury is far more efficient when administered intramuscularly. The intravenous route may also be employed. Next to intramuscular injections, inunctions are most valuable. Mercurosol, benzoate of mercury, salicylate of mercury and gray oil are the most potent.

Iodine and Iodides. At one time iodides were considered a specific in the treatment of syphilis, but it should be borne in mind that these salts are not spirillicidal in their action, but serve only as an aid in the dissolution of gummatous infiltrations, and that either arsenic or mercury or both must be administered to bring about a cure. The iodides are particularly valuable in sporotrichosis, actinomycosis and blastomycosis. The potassium salt is the one most commonly used, although the sodium preparation is equally efficient and far less irritating to the gastric mucosa and to the renal epithelium. When the drug is employed by mouth it should be given after meals, well diluted and followed by a tumblerful of sweet milk or ginger ale. Whenever large doses of iodides are administered, an ounce of the potassium or sodium salt should be dissolved in one gallon of water,—this amount to be drunk daily in fractional doses at regular intervals.

Sedatives. The use of bromides is indicated for the relief of the tormenting pruritus, pain and insomnia accompanying a long list of dermatoses. Unfortunately if continued for an extended period for their calmative effect, they have a decidedly aggravating influence upon the cutaneous lesions. (Bromoderma, etc.) Opiates should never be used to combat itching, as they not only bind up all secretions, but render the patient more uncomfortable than ever by increasing the intensity of the pruritus. Adalin-luminal works very favorably in my hands.

I shall now digress from internal treatment and discuss the drugs used for external measures.

EXTERNAL TREATMENT

The skin is constantly exposed to parasitic attack. When one considers the number of micro-organisms that perpetually use its surface as a roosting place, its comparative freedom from disease is almost astounding. The local applications used in dermatology can be conveniently divided into five groups: 1. Cleansing agents; 2. Soothing and protective applications; 3. Antipruritics; 4. Keratolytics; 5. Reducing agents.

Cleansing Agents. The use of water, either pure or medicated by holding medicinal agents in solution or suspension, may be applied in the form of general baths or local ablutions. It may be employed continuously for days or for a few moments at a time. Soft water is to be used

when practicable and as near body temperature as possible. In acute inflammation of the skin, the use of pure water should be interdicted, and even when of proper temperature, soap and water washing may prove quite harmful. The medicaments incorporated in the water for bathing purposes are chamomile blossoms, potassium permanganate, starch and bran. Sulphur is often very efficacious in scabies. For cleansing purposes light oils by ablutions or in the form of compresses are very useful. Benzine may be used likewise if not repeated too frequently. Soaps, medicated or otherwise, are occasionally of service in the treatment of chronic cutaneous diseases. For cleansing purposes, old, well-dried castile soap is probably the best and the least irritating. When a keratolytic effect is desired, as in psoriasis, seborrheic dermatitis or acne vulgaris, a potash soap is very applicable, especially sapo viridis. Medicated soaps formerly used by a number of dermatologists resulted in disappointment, as experience has shown that they possess very little therapeutic value.

Soothing and Protective Preparations. The cardinal indications in the treatment of all cutaneous maladies are to relieve irritation and subdue the itching. These needs may be met by direct sedatives or anesthetics, the application of mild astringents, or the use of evaporating lotions in the form of dressing which will exclude the air. Commonly recourse is had to a lotion containing phenol, zinc oxide, starch and powdered calamine in water or in carron oil. This mixture is antipruritic, soothing, protecting and cooling, while a lotion containing small amounts of opium and lead acetate is sedative, astringent, cooling and slightly antipruritic.

Antipruritics. For the local treatment of pruritus a series of procedures and remedies may be utilized. *Water solutions.* These are more effective when hot, although sometimes they act better when lukewarm or cold, and include infusion of chamomile blossoms, lime water, cherry laurel water, liquor carbonis detergens. For isolated lesions various solutions may be used, as camphorated oil 1:10, camphorated alcohol 1:10, resorcin 2 to 5 per cent. in alcoholic solution, menthol 1 to 2 per cent. in alcoholic solution, mentholated oil 1 to 2 per cent. or carbolized glycerine (phenol 5 per cent. in equal parts of water and glycerine). Especially advantageous are the alcoholic solutions of thymol ½ to 1 per cent., coal-tar emulsions 5 to 10:1000 to which castor oil or glycerine are added to prevent too rapid drying. *Ointments.* The application of a fatty substance on a pruritic region sometimes suffices to bring considerable relief to the patient. Benzoinated lard, cerate of pure vaseline, or naftalan may serve this purpose. Needless to say it is often very advantageous to incorporate one or several of the antipruritic medicinal agents with salves or pastes. Use is frequently made of menthol 1, chloral hydrate and camphor aa 5 in a lanolin-vaseline base, or same proportions in an olive oil base. *Occlusive dressings.* Undoubtedly the mere fact of protecting the diseased surfaces from the air presents a valuable measure for the control of pruritus. Salves and pastes evidently owe to this a considerable share of their efficiency.

Keratolytics. These are medicinal agents which aid in softening and separating the external portions of the horny layer of the skin from its deeper connections. This group of therapeutic agents is applicable to chronic scaly dermatoses and to keratoses. Salicylic acid is the keratolytic agent par excellence. In small percentage, 1:100, it figures in many pastes and salves as a mordant and antipruritic agent. In stronger dosage, 5:100 in petrolatum, it constitutes the most potent detersive. (Psoriasis, ichthyosis and keratosis pilaris.) In benzoinated lard and castor oil 5:200, especially when immediately covered with an impermeable tissue, it displays its maximum activity. Alkalies, particularly potassium hydroxide, belong to the keratolytic group, but should be used with caution. The keratolytic action of soaps is due to the free alkali they contain.

Reducing or Oxidizing Agents. Such drugs dehydrate diseased tissues. Under this heading we include a series of extremely valuable dermatological remedies, which have the common feature of being more or less avid of oxygen. This property, according to Unna, accounts for their biological action. Weak reducing agents, or even strong reducing agents employed in weak dosage or for a short time, are keratoplastics, antiseptic, and relieve congestion and itching. Strong reducing agents are exfoliating, highly irritating and give rise to severe epidermal dermatitis.

The reducing agents in progressing order of their activity are the following: mercurial salts, resorcinol, sulphur and tar. The most energetic are undoubtedly pyrogallol and chrysarobin. I shall discuss only tar, resorcin and sulphur. *Tar* is not a panacea but a valuable adjunct in the treatment of dermatoses; it champions the cause and when properly used produces almost magic results. In strong dosage it acts as a reducing agent, and in weaker dosage is an excellent antipruritic. It is particularly indicated in the treatment of infantile eczema. The following formula has proven to be very successful in combating the so-called incurable infantile eczema:

Coal tar crude	2.
Zinc Oxide	2.
Naftalan	10.
Petrolatum qs	30.

The skill displayed in gauging the proper dosage makes the doctor smile and the patient satisfied. In the choice of excipients and combinations, the fact must be kept in mind that the wood tars of pine, juniper and oil of cade have an acid reaction, whereas, mineral or coal tar is alkaline in reaction.

Sulphur, popularly heralded as a blood purifier, has failed in its mission and resulted in disappointment, but it retains its deserved reputation as a scabicide. It is a remedy of great merit in all seborrheic conditions. Precipitated sulphur is to be preferred to the other compounds. It is irritating to the acutely inflamed skin, but is much better tolerated than tar in conditions of subacute or chronic exudates. *Resorcinol* is a drug which merits frequent usage. It is especially indicated in disorders of the scalp due to seborrhea. It may be employed in the form of ointments or alcoholic solutions in the strength of from 5 to 20 per cent. In condyloma acuminatum the application of pure crystals is very efficacious. Euresol (acetoresoricinol) is very valuable for itching scalp, dandruff and falling hair. The following formula works admirably:

Euresol	8.
Oleum ricini	2.
Alcohol	100.
Spirit myrciae	100.

Ichthyol is a drug which may be employed both for internal and external use. When first introduced to the medical profession by Unna it was accorded a royal welcome and universal claims were made for its use, but time and experience have shown that some of the claims made for it were exaggerated. However, it is quite a valuable drug in the armamentarium of the general practitioner as well as the dermatologist. It may be employed in watery solution, in glycerine or with fatty bases. It may also be combined with Pasta Lassar. The dosage varies from 5 to 50 per cent. depending on the purpose for which it is used. As a reducing agent, 10 to 20 per cent.; antipruritic, 3 to 5 per cent.; antiphlogistic, 50 per cent. It may be administered internally in doses of 5 to 10 grains t i d and does not cause gastric disturbance. The indications for its use are: chronic eczema, sycosis, psoriasis and all conditions where a keratoplastic agent is desired.

HOW THE WOMEN'S AUXILIARY CAN MOST EFFECTIVELY HELP ORGANIZED MEDICINE*

CHARLES J. WHALEN, M.A., M.D., LL.B.
CHICAGO

National prophylaxis and national politics are two points of leverage in the promotion of public health and welfare and of the future of the medical profession in which the tasks for the Women's auxiliaries most immanently lie.

Under national prophylaxis come these main subdivisions of educational labor both by precept and by example:

1. Community education in sanitation:

2. Community education in necessity for periodic health examination:

3. Community education in what scientific medicine is doing for the public health and welfare—research and therapeutic advance:

4. Community education as to the danger of cults and charlatanism:

5. Community education as to the danger of false leaders, false doctrines and false reforms:

6. Community education as to the dangers of socialized medicine and community control of the practice of medicine:

Under national politics come these main subdivisions of political labor and education both by example and by precept.

1. Educational crusade against falsely premised legislation of which much is proposed in all

*Published on request of the Cook County Women's Auxiliary. Address before this organization December 5, 1928.

communities at annual meetings or convenings of public governing bodies such as town and city councils, state legislatures and general assemblies and the national congress.

2. Educational crusade against such anti-scientific tendencies as will eventually remove the practice of medicine entirely from the hands of the profession and place it under political control of laymen.

3. Educational crusade against such anti-scientific and anti-welfare measures as permit the lay dictation of the practice of medicine.

Community education in sanitation must be done first and most ably by precept and by example just as the force of women's auxiliaries in politics is based upon the willingness of these auxiliaries to get out and to vote against those candidates who refuse to support the policies protective to both the public welfare and to scientific medicine as outlined generally a few moments ago. The ballot is the only understandable force in the world to the man who is in politics. If the candidates for office shall refuse to be also the candidates for those ideals and necessities for which women's auxiliaries stand, then it will be up to the women's auxiliaries, nay, it is up to them right now, to seek out and to support some candidate who will. This point is injected right here at the start because it is one of the deadly menaces hanging over us right now. Here in Illinois with the convening of the General Assembly at hand the vaster proportion of the citizens fail entirely to be cognizant of the sinister significance of the approaching introduction of the Anti-Vivisection Bill and the Sheppard-Towner-Newton Bill.

After the original Sheppard-Towner bill had been passed the majority of those who advocated it, and of those who endorsed it in those splendid organizations, their women's clubs, were shocked and mortified to discover that what they had voted for was not what they had thought it was, at all. In fact, the women who had thought they were on the way to help their more destitute or more isolated sisters in that most terrible hour of women's need, the time of maternity, discovered that they were not doing that at all. That instead of voting for care and shelter for mothers and children in this vital hour, that the votes were cast as the endorsements had been made for a measure that afforded many political jobs and did not permit one cent of taxpayer's money to be spent for what was personal maternity care.

The trouble lay in the fact that the wrong sort of information—a genuinely false propaganda about this bill as set forth in women's organizations—had so stirred up the hearts and determined the heads of hundreds of thousands of women the country over that it was through this endorsement that the bill got by. One of the saliencies for the women of the country, and especially the Women's Auxiliary of the medical profession, to attack immediately is this question of utilizing the forum of women's operations for the dissemination of the dishonest kind of information about medical and sanitary matters. So important are the antivivisection bill and the long chain of vicious measures and objectionable tendencies, of which typical examples are the old Sheppard-Towner act and the new Sheppard-Towner Newton bill, that almost it might be urged that for the present it would seem vital that the women's auxiliaries should temporarily suspend all other activities to focus their forces upon combating this special section of existing and increasing evils.

The antivivisection bill may be given first attention as its appeal is that of freshness. Here is a new plaything for the idle and unthinking. Antivivisection has lain dormant to an extent for a few years, gathering its forces for the present attack—all the more inexcusable since the benefits to humanity by those very procedures that the antivivisectionists attack is assuredly incalculable.

A BRIEF FOR VIVISECTION

WHAT ANIMAL EXPERIMENTATION HAS DONE FOR MANKIND AND ANIMALS

Vivisection or animal experimentation is *absolutely indispensable* to progress in the prevention and cure of human disease, and accident.

Hundreds of thousands of American people living today owe their lives to advancement in medical science, progress in which has been made possible only through the medium of experimentation on animals.

Even the life of animals themselves has been made more secure through the medium of animal experimentation and vivisection.

Further progress in the reduction in sickness and mortality is possible and to a most impor-

tant extent depends upon further experimental procedure of this nature.

To retard the progress of medical research by the abolishment or unnecessary restriction of animal experimentation is needlessly to sacrifice the lives of hundreds of thousands of human beings—and also of animals.

Some conception of the very material advances that have been made in the prevention and treatment of diseases or results of accidents, advances that have been made possible chiefly through the medium of animal experimentation or vivisection, may be gained from the following summary:

1. Dog distemper: Discovery of vaccine as prevention and serum for cure of distemper in dogs, announced in England, November 29, 1928, as a result of five years' research conducted by the Mill Hill Laboratories of the Medical Research Council on behalf of the Field Distemper Fund and its subscribers.

2. Typhoid fever: Use of anti-typhoid serum during the world war effected a reduction of the deaths from typhoid fever to 200 out of 2,000 cases among 4,000,000 men mobilized, as against 2,000 deaths in 20,000 cases of typhoid and less than 150,000 men mobilized in the Spanish-American War. In other words, this serum reduced the death rate ratio in the world war from a probable 56,000 deaths and 560,000 cases, had the same ratio prevailed as during the Civil and the Spanish-American wars.

3. Diphtheria: Use of antitoxin has reduced death rate in diphtheria to seven and eight-tenths (7.8) per hundred thousand population, as against a previous mortality of as high as eighty-five (85.) per hundred thousand, or a reduction of about ninety per cent. These figures naturally fail to include any statistics as to the morbidity and permanent disability prevented by this discovery.

4. Smallpox: Vaccination, resulting from animal experimentation, has practically eliminated this scourge from civilized countries, thus short circuiting a disease of successive epidemics each of which killed millions and disfigured millions more. Indeed, true smallpox has become a rare disease today because of vaccination, and in cases where inoculation has been done, there is seldom if ever smallpox disfigurement.

5. Yellow fever: Findings of animal experimentation coupled with those from human sacrifice have practically abolished yellow fever, one of the scourges of the civilized world.

6. Plague: Through anti-plague serum, this disease with its death rate that ran as high as ninety (90) per cent., is no longer an element to be dreaded; in fact, is comparatively unknown. Animal and human experimentation demonstrated the cause and mode of transmission of this disabling and deadly disease, that cost the lives of hundreds of thousands yearly and brought complete for partial disability annually to hundreds of thousands more.

7. Malaria: Through experimental inoculation, ravages of this deadly disease have been reduced to the vanishing point. Its complete abolishment is only a matter of time.

8. Lockjaw: Anti-tetanic serum prevents the previously fatal lock-jaw resulting from operations and after accident, and is a specific for mortality from this infection.

9. Hydrophobia: Rabies vaccine has reduced the death rate from hydrophobia, previously uniformly fatal, to a fraction of one per cent., and the danger of possible infection from hydrophobia is daily minimized by the increasing administration of preventive serum to dogs, thus saving the dogs as well as the people.

10. Epidemic cerebro-spinal meningitis: Serum treatment has reduced death rate from ninety per cent. to less than 20 per cent., and minimized ensuing deformities.

11. Pneumonia, most deadly of diseases: Through animal experimentation a serum has been discovered that has reduced the mortality in type I of this much dreaded disease from 25 per cent. to 7½ per cent., and a vaccine has been perfected that has reduced the mortality in all four types of pneumonia from 40.5 per cent. to 21.2 per cent., or approximately a 50 per cent. mortality reduction in all types of pneumonia has been achieved as a result of animal experimentation. Further experimentation is sure to bring about complete control, cure and prevention of this much dreaded disease.

12. Tuberculosis: Due to animal experimentation, to a large degree, tuberculosis has been reduced 50 per cent. in twenty-five years. The early diagnosis of tuberculosis is often made and the patient's life saved through the sacrifice of a guinea pig, when the diagnosis could not be made by any other method. What is the life of a thousand guinea pigs to that of a single child?

13. Antiseptic surgery: Discovery of antisepsis and opening up of miracles of modern surgery are due to animal experimentation. Emphasis must be laid upon the development of the abdominal branch of this section of medicine by which is made possible operative treatment of stomach, appendix, liver, gall-stones, intestines, pancreas, bladder, spleen, kidneys, generative organs: modern surgery of the brain and surgery of the chest, including surgery of aorta, lungs, heart, esophagus, etc.: in fact, made possible all the wonderful results of modern surgery, and a saving of thousands of lives annually and incalculable pain, invalidism and poverty.

14. Compound fracture: Reduction of death rate after compound fractures from sixty-six in a hundred to two or three out of a hundred, or a reduction of 97 per cent.

15. Ovariotomy: Reduction of death rate from sixty-six out of one hundred to merely two or three out of one hundred, or another 97 per cent. reduction. What a debt of gratitude the women of the world owe to animal experimentation in having made possible this great life-saving from surgical operations peculiar to their sex.

16. Post-operative mortality: Reduced to a negligible factor in such conditions as hernia, tumors and amputation of the breast.

17. Blood transfusion: Through animal experimentation has been perfected a method of direct transfusion of blood from person to person. Blood transfusion saves thousands of lives annually.

18. Goiter: A practically safe operation for this condition has been developed with the aid of animal experimentation.

19. Malta fever, formerly a scourge in Malta and Mediterranean countries, India, China, the United States, Brazil, and the West Indies has been almost completely abolished.

20. Maternity mortality: Childbed fever reduced from ten out of every one hundred mothers to less than one in one thousand.

21. Syphilis: Discovery of remedy to protect innocent wives and mothers and unborn children as well as others in the community at large from the horrible curse of syphilis. The presence of syphilis in patients is now discovered in ten cases where formerly it was discovered in only one. This advance in diagnosis is attributable to animal experimentation.

22. Sleeping sickness: Through experiments on animals our knowledge of the pathology, methods of transmission, and the means of treatment of the fatal "sleeping sickness" has been obtained. Because of the information thus gained successful treatment of this disease is now possible.

23. Glandular therapy: Discovery of the mysterious functioning of various endocrine glands through the medium of animal experimentation has developed information and has brought to the women of this country incalculable relief from suffering from many diseases and conditions incidental to their sex. Millions of women are now spared unnecessary suffering, thanks to animal experimentation.

24. Animal scourges: Knowledge of animal diseases, their causes, treatment, cure and prevention, have been greatly advanced chiefly through the medium of animal experimentation. Such animal diseases as tuberculosis, rinderpest, anthrax, glanders, hog cholera, chicken cholera, lumpy jaw, among others, some of which are conveyable to man, are being overcome successfully through the medium of this experimental service. If the suffering dumb creatures could but speak, they, too, would pray that this good work should continue unhindered. The number of their own kind sacrificed is indeed small as measured against the number of their own kind benefited.

Prevented a More Costly War.—Animal experimentation has provided vaccins, bacterins, and antitoxic serums; it has aided in the development of new methods of surgery and of reliable means of diagnosing infectious diseases; it taught us how to use gases during the war and how to defend our soldiery against them. In the absence of such knowledge the recent war would have cost additional thousands of lives and would have produced many additional thousands of cripples.

Basic Knowledge.—Animal experimentation has resulted in the following basic knowledge: Circulation of the blood; capillary circulation; the vasomotor mechanism; functions of the nervous system; the flow of chyle in the lacteals; the passage of chyle through the lymph ducts into the venous circulation; the nature of the diges-

tive fluids and chemical transformation of food through their action; functions of the liver, lungs, kidneys, and other organs; the reaction of the cells to various kinds of stimuli; significance of the endocrin glands; nature of inflammation and other pathological processes; and numerous other discoveries in physiology, pathology, and biochemistry.

Action of Drugs.—Experiments with live stock have contributed richly to the current knowledge of drugs and their uses and to the precise information we have of the therapeutic, physiologic, and toxic actions of the innumerable substances from which our useful drugs have been selected.

Without specific knowledge of how drugs act on the body as a whole, or on special parts of the body, and whether their action is immediate or cumulative, the death rate among persons and animals would be multiplied, and the greater losses among the latter would be a serious economic disadvantage.

In April, 1914, when Mr. Rockefeller gave $1,000,000 for the extension of the work of the Rockefeller Institute to include a study of animal diseases in a laboratory to be established in New Jersey, the antivivisectionists persuaded the Governor of that state to veto the bill authorizing this eminently humane work!

25. Cancer: A rapidly increasing disease awaiting solution. This disease will be conquered eventually through knowledge acquired from animal experimentation. Among women in this country one out of every seven die from cancer and, therefore, anything that will assist in eradicating cancer should be hailed as a civic necessity and should be encouraged to the utmost by all women as well as by all men. As animal experimentation is essential to attainment of requisite knowledge, it stands to reason that all right-thinking people should foster rather than attempt to disparage the proper conduct of such investigational studies.

In the light of past accomplishments and with awareness of that which is yet to be done, who is there among us who, having love for his fellow men, dare to stay the hands of those who are attempting to lift the curse of disease or aftermath of accident from the shoulders of his fellows? If there be any such inhuman creatures, enemies of our children, of humanity in general and even of dumb brutes, let them stand up and be labeled. Upon these persons, should they be successful in staying the march of medical progress by placing barriers against essential experimentation upon animals, must rest the responsibility of human lives needlessly sacrificed, and of dumb brutes condemned to suffering.

That there are such misguided persons is a community misfortune. They are commonly known as "anti-vivisectionists," but the evil they inspire and the mischief they do is beyond calculation.

Although much has been accomplished, much more remains to be done. Cancer, infantile paralysis, cerebro spinal meningitis, pneumonia, influenza and malaria are among the devastating diseases that are yet to be conquered. The hope for early victory hinges chiefly if not wholly upon further animal experimentation.

As opposed to the extraordinary list of triumphs for humanity, compare the "achievements" of the anti-vivisectionists:

CRIMES OF OMISSION CREDITED FOES OF ANIMAL EXPERIMENTATION

1. Not a single life has been saved by efforts of antivivisectionists.

2. Not a single beneficent discovery has been made by them.

3. Not a single disease has been abated or destroyed or cured by them, either in animals or in man.

4. All that they have done is to resist progress—to spend $500,000 in thirty years in Great Britain alone, and millions in the United States and elsewhere, and to conduct a campaign of abuse and gross misrepresentation, from which the harvest is easy to prognosticate from present results.

5. They care apparently little or nothing for the continued suffering and death of human beings, or the grief and not seldom the ensuing poverty of their families; provided that twenty-six out of every thousand dogs and cats, monkeys and guinea pigs, mice and frogs experimented on shall escape some imaginary physical suffering. Somehow, antivivisectionists fail to appreciate the fact that millions of animals are spared much suffering as result of animal experimentation.

6. They insist, therefore, that all experimental research on animals shall stop and—astounding cruelty—that thousands of human beings shall continue year after year to suffer

and to die, to become invalided and often not only burdens to themselves but economic liabilities to the community, their families and society.

VIVISECTION BRIEFS

If the scientists who experiment on animals were the cruel, cold blooded butchers pictured by the anti-vivisectionists, even so, yet the animals used by them would be given the greatest possible comfort, and the greatest possible relief from pain and shock and the greatest possible after-care *because the success of the experiment would require that very consideration.*

* * *

Every one who has had his life saved by an abdominal operation should realize that the operation would have been impossible and he would be dead if animal experimentation had not developed aseptic surgery. This applies to many of the infectious diseases, formerly fatal and now amenable to specific treatment, made possible by animal experimentation.

* * *

One horse furnishes antitoxin which saves thousands of human lives—and the horse continues to live with more comfort and better care than many humans about whom anti-vivisectionists do not worry.

SHEPPARD-TOWNER-NEWTON BILL

Although the Sheppard-Towner Newton bill has a few more furbelows on its skirts than did the Sheppard-Towner Act, so clever was the hoodwinkery with which the original Sheppard-Towner Act was forced down the throats of the women that a very brief resume of the act cannot fail to be of interest. I should not in all truth use the phrase "forced down the throats of the women," for so prettily was the mess meringued and jellied that the women not only swallowed it whole but actually clamored for more, and are still clamoring as this new business of the Sheppard-Towner-Newton bill testifies.

THE SHEPPARD-TOWNER ACT FAILS TO GIVE FOOD, SHELTER, CLOTHING, MEDICINE, OR MEDICAL CARE FOR ANY MOTHER OR ANY CHILD

Nothing material is given to needy mothers or children. No Maternity Hospital can be built anywhere with any part of the funds. A physician attending a destitute mother could not use five cents of the fund for medicine. No food, clothing, shelter, or hospitalization, medicine or medical care is provided for in the Sheppard-Towner Act. Not a bed for a single mother or a bottle of milk for a single baby is provided. The entire fund goes for administration, "investigations," reports and gratuities to states which agree to let a Federal Board do what they have never given the Federal Government legal power to do under the Constitution.

The principle of Federal State Aid as a means of financing Public Health work is an unsound financial policy. Under the provision of the Sheppard-Towner Act the Federal Government controls the expenditure of State Appropriations.

The ability of the Children's Bureau to dictate and largely control the appointment of the head of the Children's Bureau in each state, as well as all of the public health nurses, district superintendents and others, resulted in the organization of a large body of salaried employes appointed and largely paid by a federal bureau, yet working under a state department of which they are to a large extent, independent. Such a condition produces friction and confusion in public health work, and makes possible the development of a political machine under the control of the Children's Bureau.

With the exception of those activities which are clearly national in character, such as quarantine and the regulation of inter-state commerce, and the like, public health work is a function of the state and local governments and should be paid for out of state and local funds, and directed by state and local officials. The furnishing of instruction or care to mothers or any other persons needing such instruction is just as much a function of local government as is the providing of food and clothes for the destitute. The assumption and exercise of these functions by the Federal Government is an invasion of the legitimate activities of the state.

MATERNITY EDUCATION SHOULD BE DIRECTED AND SUPERVISED ONLY BY PHYSICIANS

The problem of reducing maternal and infant death rates is largely a medical problem. Whenever it pleases, the Sheppard-Towner Maternity act authorities can work entirely under lay direction and independent of medical control.

Sheppard-Towner Act is an inductor of the practice of obstetrics to the rule of thumb of political chicanery and machine manipulation.

It is also a fundamental process towards the eventual establishment of a permanent lay dic-

tation of the practice of medical and surgical science.

The Sheppard-Towner Maternity Act has achieved a certain amount of favor, or at the least of toleration, principally from two classes of people. In the first class may be placed those who are to benefit politically, either directly or indirectly, by this Machiavellian piece of legislation. In the second class are those who know nothing about the actual content of the Sheppard-Towner Maternity Act, but are finely misled by the name and by certain rather emotion-reflexes aroused unconsciously in the average mind by the word "maternity."

The political beneficiaries of the bill know that its intent, content and portent are pork barrel from bung to ballast. The protesting but tax-paying citizens have a bland idea that in some blanket fashion this Sheppard-Towner Maternity Act intends to dole out adequate care and shelter to mothers and children in poverty stricken homes, where maternity is almost perpetually the order of the day and where the necessaries of decent living are not.

Now that this is exactly *not* what the Sheppard-Towner Maternity Act has any intention of doing is exactly what the average citizen of the United States does not know and has pretty carefully been kept from knowing. That the Sheppard-Towner Maternity Act does intend to put upon the tax payer's bounty list herds upon top of herds of investigators, inspectors, record keepers, red tape winders and political heelers of any creed, sex, race or color, who will be legally entitled to know as many intimate details about a man's wife as he does himself, and to describe this knowledge on the public documents of the country, is exactly what the average citizen does not know; that under the mask of education as to what maternal care should be, this Act limits its benevolence to paying the salaries to scouts, sleuths and maternal secret service is another item in what the citizen is not being taught about the Sheppard-Towner Maternity Act.

The Newton Bill, better designated the Sheppard-Towner Newton Bill, is worse than the original act.

OBJECTIONS TO THE NEWTON BILL

The Newton Bill is the most despotic legislative measure for the debauchery of democracy's rights ever perpetrated against the constitution of the United States or the welfare of any nation.

Powers and principles involved in this grant are of a scope that will cumulatively deliver the constitutional rights of the country, the states, the community and the individual home into a communistic thralldom as terrible as any slavery ever visited upon darkest Russia during the rule of the royal Romanoffs. Such activities on the part of a group of selfish, misguided politicians, preying upon misinformed idealists, strike at the very root of what democracy means; of what the United States stands for; of what the constitution of the country represents, and of what, since the earliest settling of the country, patriots, both men and women, have fought and died for. That this tremendous sacrifice of ideals, principles, faith and persons should be thus discounted for the sake of a few idle, ephemeral theories that have been often tried since civilization began, and as often discarded through their own inherent weaknesses, is unthinkable.

What is this "Newton Bill"? Dissected, it resolves itself into an expansion of the Sheppard-Towner bill, all dressed up and intending to go ruthless, prying, devastating authority into the most sacred rights of the home, the family, and the individual. Giving the lie to its early promises of "No extension asked" and expiring in June, 1929, the iniquitous Sheppard-Towner bill, masquerading as an humanity at the outset and battening upon the credulous imaginations of citizens who felt that by this legislation they might evade some of their civic responsibilities and abet the humanities, the Sheppard-Towner Bill puts forth new life and extends its grasp in the so-called Newton Bill. All that has ever been used in criticism of the Sheppard-Towner Act should, to be truthful, be enlarged and detailed and emphasized to at all cover the harm that will emanate from the Newton Bill. The simple clause, "and for other purposes," is as broad as the seven seas.

The Sheppard-Towner Act was a rare old harridan of legislation. Exposed in true colors the bill was repudiated. Now, bedizened anew, but the same old Bill still, it reappears as the Newton Bill. Scratch the surface ever so slightly and there appears beyond doubt the personality of the same vile debauchee of sacred rights.

Briefly considered, the facts are these. The Newton Bill, House of Representatives Bill No.

14070, introduced May, 1928, by Representative Walter H. Newton of Minnesota. This bill proposes that the United States commit itself and embark upon a permanent policy for doing certain work in individual states, whereas constitutional authority and practice have, until now, held federal action limited to interstate responsibilities.

The Children's Bureau of the Department of Labor will inherently by this bill be the ruling power in the United States. This bureau, headed by one woman, will become the most despotic influence in the country, imposing a yoke that will annually become more unbearable in its crushing burdens.

The provision in the Newton Bill that federal money may be expended at will and at the whim of a single bureau officer in cooperation with "local associations or individuals" (extragovernmental individuals) brands the entire proposal as a golddigger's phantasy. The money which the Newton Bill proposes in this fashion to appropriate is from tax collections, of which 95.83 per cent. comes from twelve states.

Complete statistics of income for the year 1920, made public Oct. 1, 1922, show that (95.83) ninety-five per cent. of the total tax was paid by twelve states. Out of this ninety-five per cent, of the total specific percentages included:

New York	23.69
Pennsylvania	12.13
Illinois	8.68
Ohio	6.76
Massachusetts	5.82
Total	57.08
Michigan, Indiana, Iowa, New Jersey, Missouri, California, Maryland	38.75
	95.83

This leaves thirty-eight states to pay 4.17 per cent. of the taxes from which their profit on the Sheppard-Towner appropriation is easy to figure. For these thirty-eight states "Federal Aid" is a gift indeed. *Illionis is not one of the 38 to profit, but one of the twelve to pay! And in the list of those states that foot the bills, Illinois stands third. Only New York and Pennsylvania precede.*

The expenditure outline would rest not with the States but with the whim of one individual and not might be, but evidently is intended to be disproportionate among several states. It is within the bounds of conception that Illinois contributing 8.68 per cent. as one of the twelve, might receive nothing at all in return. Whereas, states contributing little or nothing would receive maximum sums, if not the entire amount of the sum collected.

If possible the Newton Bill is worse than the old Sheppard-Towner Act as the one million dollars per year is theirs to distribute almost at will without let or hindrance from State Health Boards.

The Newton Bill is "permanent legislation" if passed, and gives this radical bureau that is always usurping both the provinces of the medical profession as well as the political rights of the states and people, a permanent campaign fund of $1,000,000 a year for distribution among agencies that submit the national care of maternity and infancy by bureaucrats at Washington giving "long distance" or "mail order" treatments to mothers, via the government printing office, and setting "standards" for physicians and nurses that the social workers desire to promote.

This bill purports to be a health measure and if it is such it belongs in the United States Public Health Service, rather than as an appendix to the Department of Labor.

It is within the power of the Newton Bill to force the states to accept inefficient pseudo medical service, whether the states like it or not; for instance, Connecticut, Illinois and Massachusetts have never accepted the co-operation of the Federal Government under the Sheppard-Towner Act. Under the provision of the Newton Bill these states would have forced upon them the services of the Children's Bureau under the provision of partnership between the Children's Bureau of the federal department of labor financed by and for the spending of the money of the people of the United States. A group of uplifters in the State of Illinois or any other state may be using the money for or with a foundation, for example. With the stage thus set and the "fifty-fifty" appropriation feature satisfied, independent of state cooperation, the executive, legislative or judicial powers of the state could not prevent the operation of this amplified Sheppard-Towner Maternity Bill in Illinois or anywhere else—the legislature and the people notwithstanding.

The Newton Bill perpetuates the $1,000,000.00

per annum fifty-fifty appropriation of money: continues the meaningless and ineffective provision against the invasion of American homes by the investigators and whisperers of the Children's Bureau. Such provision is meaningless and ineffective because it carries no penalty for such invasion and puts it up to the American citizen to protect his home from such invasion either by assault upon the invader or by the very expensive way of a writ of injunction.

The Newton Bill even goes farther than the Sheppard-Towner Maternity Act and provides for a partnership between the United States Government and any group or foundation, thereby carrying interference by employees of a federal bureau of a department of the United States government into the homes within a state, over the head of the state itself, by way of a private corporation which is merely a creature of a state by reason of a charter. Through this bill the rights of the individual are nullified. A man or woman will find the political employee dictating as to private and personal liberties of a delicate nature.

The Newton Bill is subversive of the ideals, traditions and institutions of this country in that it expands the police power of the state to the point of exhibiting the proper exercise of the triune powers of government—executive, legislative and judicial, and vests all power in an individual or group of individuals, employees of a Bureau of a Department in the cabinet of the President, and bars the judiciary from restraining abuse thereof.

The Newton Bill is a contemptuous disregard of decency, as contained in the fifty-fifty partnership with busybodies over the determination of the people of a state as voiced by their representatives in the legislature.

The Newton Bill is a direct violation of the agreement of the proponents of the Sheppard-Towner Act. *In 1926 the proponents of Sheppard-Towner legislation agreed not to ask for a further extension of that act after a period of extension granted had expired.* It was said at the time it was not the intention of some of the proponents to adhere to the agreement and the introduction of the Newton Bill confirms these predictions.

In substantiation of this statement, consider some of the sweeping provisions of the pending Newton Bill.

I. *It is practically unlimited in the scope of its purposes.*

Its title is "To provide a Child Welfare Extension Service, And For Other Purposes." While it is true that the current bill provides an annual appropriation of $1,000,000 "for paying the expenses of a Child Welfare Extension Service in the Children's Bureau of the Department of Labor, which shall promote the welfare (?) of mothers and children and aid in the reduction of infant mortality," thus confining the expenditure of this particular appropriation to this particular purpose, that is really no purpose at all but one purely political, it must be noted that the title of the Act in the words *"and for other purposes"* permits future extension of this service in other fields by simply changing the scope of services as expressed in the body of the Act.

There is no provision in this Act as to how this annual appropriation shall be allotted to the several States, excepting that it is provided that "not to exceed $50,000 shall be expended by the Children's Bureau in the District of Columbia." This would permit the Washington Bureau to expend the other $950,000 wherever it pleased, all in one State if it so desired, or nothing at all in those States that will have contributed, etc.

2. *The United States Children's Bureau may set up child and maternity health services in any State or municipality INDEPENDENT OF THE LOCAL OFFICIAL HEALTH AGENCIES, under the provisions of the Newton Bill.* The proposed law reads: "That of this amount ($1,000,000) not to exceed $50,000 shall be expended by the Children's Bureau in the District of Columbia and that the remainder shall be expended *either independently* or in cooperation with the State or Territorial agencies responsible for or engaged in the promotion of the health or welfare of children, or through such state and territorial agencies, with county or municipal agencies engaged in child hygiene or child welfare work." Note that the breadth of this clause would make it legal for the expenditure of these sums to be directed in any channel —not one penny of which could legally be made to buy a dose of medicine, a shred of clothing, a bite of food, an atom of shelter, or a moment's professional care for any mother or any child. With this money the bureau could go into the banking, bakery, ship building, millinery or automobile business under pretense that it was

to benefit "mothers and children," if wished, as this freedom is sustained in the clause "or for other purposes." This is one of the most vicious features of this bill. It simply means that the constituted local health authorities may be entirely ignored by the federal agency in the set up and conduct of service. The service may be established wholly without regard to local agencies or their wishes. The conflict that this quite definitely assures is bound to result in a serious handicap to all legitimate child health and welfare service. The right to determine the program and to select the local agency to carry it on rests entirely with the Children's Bureau. The power that is thus placed in the Children's Bureau gives this group a strangle hold on all local health agencies so far as child health and welfare services are concerned and permits lay dictation or distortion of medical service. No self respecting health officer in this country will countenance this attempted federal invasion of the service he is sworn to administer. It behooves the medical profession and the public generally to keep close touch with any such threatened malign development.

Again let it be emphasized that the Newton Bill is wrong in principle. The principle of Federal State Aid as a means of financing public health work is an unsound financial policy.

Maternity education should be directed and supervised only by physicians. The problem of reducing maternal and infant death rates is largely a medical problem. Under this bill, whenever it pleases them the Children's Bureau authorities can work entirely under lay dictation and independent of medical control.

If enacted into law the Newton Bill will amount to a fundamental progress towards the eventual establishment of a permanent lay dictation of the practice of medicine and surgical science.

The intent of the Newton Bill is to do away with the restrictions thrown about the Sheppard-Towner Act and give to a bureau in the Department of Labor that has nothing to do with public health, a free hand, not only in the matter of educating mothers and, presumably, their attending physicians both in matters pertaining to childbirth and in all other health matters as well, for it is not possible to separate the two.

The amount of money the bureau may spend in any state, or whether it has to spend any money in any particular state, and the safeguard at the present time thrown around projects to be put out by the maternity board, are very much reduced by the Newton Bill.

Under the Sheppard-Towner Act any procedure proposed by the Bureau must be approved by the Surgeon General of the United States Public Health Service, the chief of the Children's Bureau and the commissioner of education.

Now, under the Newton Bill this safeguard disappears. This power of veto is nullified. What restriction there is upon the head of the Children's Bureau, the dangerous despot to which previous allusion has been made, lies upon a so-called advisory board—a check rein in name only. This board will have an advisory function but no real authority and with this board the bureau may or may not consult, as it sees fit.

The Chief of the Children's Bureau will be chairman of the board and appoint five of its nine members. The Surgeon General of the United States Public Health Service, the director of extension work of the Department of Agriculture and the Commissioner of Education are the other three members.

Under the Sheppard-Towner Act the federal government has been able to control in some measure health activities in the several states by virtue of appropriations the government has been in a position to make or withhold. Under the Newton Bill, if enacted, the bureau will be in a position to parallel or contravene or cut and slash, in this field, as it may desire.

This proposed act becomes "permanent legislation," if passed. It gives the radical group administering the United States Children's Bureau not only permanent but further autocratic power to usurp the field of the medical profession in one of its most important aspects towards public welfare. It contemplates a flagrant invasion of State rights that must not be tolerated. It is a distinct menace to locally constituted public health authority and threatens endless conflict between a self-centered Washington group of office-holders and local health authorities as well as with the medical profession, as such *it is not in the best interests of public health advancement and medical welfare.* It demands the active opposition of all the people.

This Bill, H. R. 14070, is now resting in the Committee on Interstate and Foreign Com-

merce and may be called up for hearing at an early date.

As an attempted invasion of State rights, the Newton Bill stands without an equal in the history of American legislation. It opens the way to further legislation which will eventually deprive all the States of their time honored and most cherished privilege of local self-government. It would establish a precedent for federal regulation in every field of local human endeavor.

The Sheppard-Towner Act and the pending bill have, however, some points in common. Neither of them lays down any line of demarcation between the welfare and hygiene of mothers and children, and the welfare or hygiene of the rest of the people, so as to limit operations under the act to a clearly defined field. Neither the Sheppard-Towner Act nor the pending bill contains anything to show why money appropriated for health activities should not be spent under the direction of the United States Public Health Service, which was organized for such work, instead of under a bureau that must duplicate a considerable part of the medical corps already organized and functioning in the Public Health Service, if it is to work effectively.

The average citizen does not know what, under the mask of "Education as to what maternal care should be," this Act intends to do.

The old Sheppard-Towner Act expires by limitation June 30, 1929.

As the protagonists of the old Sheppard-Towner Act concede that this vicious piece of legislation is now practically dead, these propagandists have proceeded to raise it by proffering this ghost that is stronger than its original entity, is known as the Newton Bill (better designated as the Sheppard-Towner Newton Bill, a bill to provide a Child Welfare Extension Service and for other purposes). This bill has the poignancy and force of a phoenix newly risen from the ashes of public wrath that consumed the Sheppard-Towner Act and its iniquities. Let it be repeated that the Sheppard-Towner Newton Bill aims to perpetuate the principles of the old Sheppard-Towner Act but on a much broader basis. It authorizes an appropriation of $1,000,000 annually for a Child Extension Service in the Children's Bureau in the Department of Labor.

The difference between the old Sheppard-Towner Act and the new properly designated Sheppard-Towner Newton Bill indicates the extraordinary reaching out for power acquisitiveness of the pending legislation. The Sheppard-Towner Act is self limited; the Newton Bill seeks to establish a permanent policy. The Sheppard-Towner Act recognizes the right of every state to control health activities within its own borders; the pending bill would actually authorize the Children's Bureau to carry on its activities independent of state agencies. The Sheppard-Towner Act defines the method for the distribution among the states of money appropriated under its authority; the Newton Bill is limitless in its interpretation.

Section 4 gives the inference that there is a plan to work with and upon individual children in the United States, except where specifically prohibited by the parent or guardian of an individual child; such a plan can operate only upon the assumption that the child is the property of the state. That is to be denied and should cause alarm to the parents of children and to all American economists. The family is the unit of government and should be closely guarded against inroads of social thought. Whenever such inroads shall have been quietly perfected, then our government will be seen to have abdicated in favor of a communist revolution—not a desirable thing.

The greatest need, legislatively speaking, in the United States today is decentralization of government at Washington. "America is the most law ridden country in the world. In fact, America is forced by law to do and prohibited by law from doing more things than had been prohibited or required in autocratic Europe before the war."

Bureaucracy is always a curse, and centralization a lethal menace under any conditions. Where the practice of medicine is concerned, it is fatal.

Briefly recapitulated, let the women's auxiliaries bear in mind these vitalities to be guarded against as destructive eventualities in public economics and the future, both of medicine and the public health and welfare, and national stability as the medical profession itself has concentrated. These Fundamentals include combating

1. Lay dictation and control of medical practice.

2. Endowed foundations entering practice of medicine.

3. Corporations engaged in medical practice.

4. Inimical medical legislation.

5. Political control and interference with medical practice.

6. Unrestricted activities of quacks with general public health.

7. Lay and semi-lay pay clinics for other than the poor.

8. Supersedence of physician by overtrained nurse.

9. Health departments practicing general instead of preventive medicine.

10. Various other similar and correlated vicious tendencies. A plan for combating these evils through your Women's organizations may be thus analyzed:

1. Classification and centralization of the resources of the auxiliary in point publicity.

(a) Women engaged in research work of public interest.

(b) Women tangent to the lay press, the lecture platform, stage and other centers of public distribution.

(c) Medical women in the public eye, whose spoken or written word has a publicity value.

2. Establishment of general publicity media for news and feature material which shall tend to:

(a) Correct misinformation on medical subjects.

(b) Place the profession more conspicuously in the lay press.

(c) Present an adequate background for additional protective legislation.

3. Enlistment of active co-operation from the women's organizations in the state for the purpose of:

(a) Making the campaign an affair of every woman rather than of a committee.

(b) Securing for major news a state-wide diffusion that will exceed syndicate possibilities.

(c) Radio talks by doctors.

For the accomplishment of this, the Auxiliary must act as an educational committee. The "press agent" part of this auxiliary's duties include:

1. Preparation of feature articles for use in Club Magazines with a substantial circulation in Illinois.

2. Preparation of stories based upon current activities of the auxiliary that will be suitable for use by syndicates, press associations and city newspapers, and for adaptation by country newspapers.

3. Establishment of press contacts.

4. Preparation of material for use by members who will speak before clubs.

5. The general contact point between the lay women and the auxiliary in the State of Illinois.

6. Personal conference with women's organizations throughout the state at some time during the year in order to:

(a) Convince the membership of these clubs of the necessity for and the suitability of the campaign.

(b) Local problem analyzation.

(c) Establishment of procedure for the handling of local publicity opportunities.

(d) Enlistment of participation in campaign from the local branch membership.

7. Establishment of central bureau to provide speakers and to create opportunities for these speakers to discuss subjects worthy of and suitable for presentation in a popular vein to clubs.

8. Establishment of organization contacts to co-ordinate with the lay press, and the inauguration of popular "drives" on projects designated by the governing committee.

AGRANULOCYTIC ANGINA*

I. M. Trace, M.D., F.A.C.P.

Attending Physician, Department of Medicine, Cook County and Mt. Sinai Hospitals

CHICAGO

Agranulocytic angina is not a common condition. Of late, however, cases have been reported more frequently, and, with better knowledge of the syndrome, it will be recognized still more often. The reported three cases have been seen in a little less than three months.

Case 1. Mrs. C., female, aged 32, of excellent health, has taken ill suddenly with fever and a sore throat. She was toxic; a gangrenous membrane cov-

*Read at a Clinical Meeting of Illinois State Medical Society in Cook County Hospital.

ered the tonsils and fauces. Diphtheria was suspected and antitoxin given, although repeated throat cultures were negative for Klebs-Löffler bacilli. A week later an otolaryngoloist in council suggested Vincent's angina and topical application of neoarsphenamine. Vincent's organisms were not found. Patient did not improve. On the ninth day she developed arthritic pains. The joints were not hot or swollen. On the twelfth she had an acute circulatory collapse, from which she rallied. When seen by me on the fourteenth day she was profoundly prostrated, mentally lucid, and felt that the end was near.

The temperature was low, the pulse rapid and weak, and the systolic blood pressure could not be obtained. The lungs were clear. The entire left arm was enormously swollen, was not tender, and without any inflammatory signs. It did not pit; the radial pulse was weak, but present. The blood smear showed total absence of the granular polymorphonuclear leucocytes and a pronounced paucity of the white blood cells. She died four hours later.

Case 2. Mrs. R., female, aged 42, previously healthy, took ill suddenly with fever of 104° and a sore throat. Antitoxin was given on suspicion. Throat cultures were negative for diphtheria bacilli, and Vincent's spirilla. On the fifth day consolidation of the left lower base was present.

When seen by me in the hospital on the evening of the same day, the temperature was 104°; respirations rapid but no cyanosis; a greenish yellow flat membrane indolently spread over tonsils and fauces. The left pulmonary base was dull, with bronchial breathing and scanty rales. The patient was profoundly exhausted, of clear mentality, pulseless, systolic pressure not obtainable, and death took place seven hours later. The white blood count numbered 2,000 and the granular leucocytes were absent.

Case 3. Mr. W., male, aged 25, came down with a sore throat and high fever; very toxic; antitoxin given; treated as a Vincent's angina; no improvement. Throat cultures negative for Klebs-Löffler bacilli and Vincent's organisms; blood culture sterile. The blood showed a moderate secondary anemia, a white count of 1,200 with only 4 per cent. of polymorphonuclears.

When seen on the seventeenth day of the illness, he presented the picture of severe circulatory collapse and died a few days later in spite of repeated blood transfusion. He was also given neoarsphenamine.

All the three cases had in common: A severe gangrenous angina, a marked neutrophilic leukopenia, and a fatal termination.

This clinical syndrome was described by Schultz of Berlin in 1922. Its specific etiology is not known. Most cases occurred in women. Rotter's case and my third were in males. Dodd and Wilkinson reported a case in a child of eleven[3] following the administration of .45 grams of neoarsphenamine. They collected 24 similar cases in adults. One case came on seven weeks after a fracture[4]; another followed extraction of teeth.[2]

The bacteriology of the local lesion lacks uniformity. Vincent's organisms, diphtheria bacilli, strepto and pneumococci, and the bacilli pyocyaneus, were found. The blood cultures are more often sterile or show a variety of organisms.

The tonsils, pharynx, gums or any mucous membrane may become the seat of an ill-defined gangrenous necrosis with a total absence of any inflammatory reaction. The lungs often show a fibrinous, hemorrhagic, non-cellular exudate.

The blood and the blood marrow, even intra vitam, show a marked diminution or total disappearance of the granular element. The tissues lack all evidence of any cellular inflammatory reaction. They show some lymphocytosis and a marked proliferation of the plasma and endothelial cells.

Its pathogenesis is far from clear. At present it is presumed to be either an infection or an intoxication leading to destruction or exhaustion of the granular leucocytes in the blood and bone marrow.

The body, thus robbed of its defensive mechanism, falls easy prey to severe infections and any mucous membrane, always the habitat of various organisms, may become the locus minoris resistentiae.

Agranulocytic angina sets in with fever and a gangrenoulcerative lesion of some (commonly, however, oral) mucous membrane, parading as a diphtheria, Vincent's angina, or a so-called septic or streptococcus sore throat.

The regional glands, the liver and spleen may be enlarged, jaundice occurs. The white blood cells number from 1,200 to 2,000. Counts of 100 and even 8[3] were reported. The polymorphonuclears are much diminished or absent. The red blood cells, hemoglobin, and blood platelets are not much altered. Cutaneous petechiae and even gross hemorrhages may, but rarely occur. Pulmonary consolidation often appears early, and death usually closes the picture in about 8 days with marked exhaustion and circulatory collapse. It may occur on the second day or as late as the sixth week.

Agranulocytic angina is overwhelmingly, but not invariably, fatal. Recoveries have been reported and relapses occur.

A gangreno-ulcerative lesion of any mucous membrane, when diphtheria and Vincent's

angina are ruled out, should arouse the suspicion of agranulocytic angina, and a leukopenia with a marked diminution of the granular leucocytes will make the diagnosis.

Arsenic, thorium and benzol may cause a similar blood picture, and a neutrophilic leukopenia, even associated with a stomatitis, may follow intensive x-ray exposure.

The aleukemic leukemias and the gangrenous stomatitis of an acute leukemia, lymphoid or myeloid, show a pronounced hemorrhagic diathesis; immature white cells are always present in considerable numbers, and extensive cellular infiltrations are found at autopsy.

Yet at times the differentiation of agranulocytic angina from leukemic states is difficult, nay, almost impossible. Petechiae and visceral hemorrhages may be present; some cells may even show the oxydase reaction and some lymphocytic infiltration may even be found postmortem in agranulocytic angina. Cases of sepsis with stomatitis and a neutrophilic leukopenia may be mistaken for agranulocytic angina, but the severe hemorrhagic diathesis, the thrombopenia, and especially the positive blood culture with the always demonstrable primary focus of infection make its recognition easy.

Infectious mononucleosis, the so-called glandular fever, usually a disease of childhood, occasionally occurring in adults,[5] may with some soreness of the throat and the disappearance of the granular leucocytes resemble agranulocytic angina, but the respiratory catarrh and the marked leucocytesis easily lead to its true recognition.

The acute leukemias, sepsis with a neutrophilic leukopenia, and agranulocytic angina are regarded by the best students of the subject as distinct clinical entities, in spite of their many points of similarity.

Treatment is futile. Repeated blood transfusions have apparently only postponed, and for a short time only, the fatal termination. The newer arsenicals have been recommended. They have been etiologically responsible[3] for a number of cases of agranulocytic angina, and are only mentioned to be emphatically condemned.

Our therapeutic hopes lie in the possible discovery of the cause and till then in some drug or measure that will enhance the feeble defensive attempts of the reticulo-endothelial system.

SUMMARY

1. Three fatal cases of agranulocytic angina are reported; two in females, one in male.

2. All three cases showed a gangreno-ulcerative angina with a marked neutrophilic leukopenia.

3. All treatment, including repeated blood transfusion, was futile. Arsphenamine and neoarsphenamine should not be used.

4. All three cases were diagnosed and treated as diphtheria, Vincent's angina, and streptococcus sore throat and their true nature not recognized till the blood was examined.

5. In a gangrenous lesion of any mucous membrane, where diphtheria and Vincent's angina were ruled out, the possibility of agranulocytic angina should be borne in mind and a blood examination made.

BIBLIOGRAPHY

1. Kastlin, G. J.: Am. J. Med. Sciences, 173, 799-814, June, 1927.
2. Hill, H. P.: Calif. and West Med., November, 1926.
3. Dodd, Katherine, and Wilkinson, Scott J.: J. A. M. A., 90, 9, March 3, 1928, 663.
4. Jackson, Harry: Chicago Medical Society, March 23, 1927.
5. Cady, Lee D.: Am. J. Med. Sciences, 175, 4 April, 1928, 673.

DIPTHERIA IMMUNIZATION CAMPAIGN*

ELIZABETH B. BALL, M. D.
Pediatrician, Dept. Public Health
SPRINGFIELD, ILL.

The record of scientific endeavor in the recognition, control and prevention of diphtheria marks interesting chapters in the development of preventive medicine. When Loeffler in 1884 proved the diphtheria bacillus to be the specific cause of diphtheria, it was thought by many that this disease would soon be placed among communicable diseases which are easily controlled and prevented.

Toxin-antitoxin. However, it was not until 1913 after the research workers had acquired considerable skill in the preparation and use of toxin-antitoxin mixture, that the first attempt was made to actively immunize children against diphtheria. This was done by Behring. His investigations, however, were soon stopped by the war. The work was carried forward in New York

*Read before the Section on Medicine, Seventy-eighth Annual Meeting of the Illinois State Medical Society, Chicago, May 8, 1928.

City, where Dr. William H. Park of the City Health Department Laboratories had for some years been conducting studies similar to those in Europe. The results in New York City showed that the toxin-antitoxin treatment is harmless and that it gives a durable immunity. When these facts were definitely established, its use was advocated for the whole child population. The course of treatment consists of three doses given about one week apart. The effect is to produce what is known as an "active immunity." The immunity thus produced develops slowly, requiring a period of from two to six months, before the protection becomes effective, that is to say, before sufficient antitoxin is present in the body to protect the individual against diphtheria. This protection usually lasts for years, perhaps for life. While toxin-antitoxin is not 100 per cent. perfect, at least it immunizes 97 per cent. of the children during the years when they are most susceptible to diphtheria.

The Schick Test. By the use of a test devised by Dr. Bela Schick of Vienna in 1913, we have a simple and helpful means for ascertaining whether a person is susceptible to diphtheria. The Schick test was an outgrowth of the observation that if a very small amount of diphtheria toxin is injected into the skin of a person who has recovered from the disease, or is naturally immune, the toxin will be neutralized and no effect produced by the injection. If the individual tested is susceptible, the injection of toxin will produce a slight local irritation, shown by a small red spot.

The widespread use of this test has given us much valuable information regarding control measures for this disease. It has shown that infants up to six months are usually immune, and that children from 6 months to 6 years are in the age group of highest susceptibility to diphtheria. This group, therefore, is in the greatest need of toxin-antitoxin protection. The Schick test has also given us important data regarding differences in the susceptibility of social, racial and geographical groups. The test has also been valuable in revealing how effective the toxin-antitoxin mixture is in producing the desired immunity and in showing how long this immunity lasts. To make certain that immunity has been established, the test may be given 5 or 6 months after the toxin-antitoxin injection, for, as stated, it usually takes that length of time for the protection to become effective.

Eradication of Diphtheria. In spite of the fact that toxin-antitoxin will prevent diphtheria and a Schick test will discover the susceptibles, diphtheria continues to be the third cause of death in the United States for children under six years of age and the mortality in recognized cases is still 10 per cent.

Consideration of these facts makes our duty as physicians plain. We must educate parents to realize the value of these scientific achievements and the practical use of the same in their own families. We must urge that all children between the ages of 6 months and 6 years be given the three doses of toxin-antitoxin and that older children be given the Schick test to determine whether or not they are immune to this grim enemy.

So far the majority of us are agreed, but the average physician in general practice hesitates to urge his people to use a preventive measure with which he is somewhat unfamiliar or which to his mind has not proved its value sufficiently to warrant its general application; or again the reputable physician refuses to do that which savors of advertising. As progressive doctors of medicine are we satisfied to sit back and wait for the precious few parents who have a vision to apply their knowledge in a practical manner and ask that their children be given the means to protect them from disease, or rather, do we not desire to see every child protected?

How may we save thousands of little children from enduring the painful mental and physical sufferings entailed by an attack of diphtheria? How may we prevent the chronic discharging ears, the chronic heart and kidney lesions and the other pathological conditions which follow in the wake of an attack of diphtheria and frequently persist as long as the unfortunate victim lives.

These questions have been satisfactorily answered by medical men all over the world, by the work of Dr. William H. Park of New York, and the late Dr. Abraham Zingher also of New York State where over 400,000 children have received toxin-antitoxin. We quote the following statement made by Dr. Zingher in a discussion

of a paper on diphtheria and published in the American Medical Journal, issue of November 4, 1922:

New York. Dr. Zingher said in part:

I should like to mention one or two points in connection with the work that we are planning for this summer among children of preschool age. We have practically finished all the public schools in New York City. A great educational campaign has been conducted through these schools in teaching the people the great value of these newer preventive measures against diphtheria. More than 800,000 homes have been reached. We intend to utilize this valuable propaganda. We shall offer the people the opportunity of having their children who are from 6 months to 6 years of age protected against diphtheria. We are emphasizing the fact that every child in this age group should be inoculated against diphtheria just as it is vaccinated against smallpox. We shall give these young children the three injections of toxin-antitoxin without a preliminary Schick test; reserving, however, the issuing of a diphtheria protection certificate for the time when the children show a negative Schick reaction. These Schick tests will be made when the children are admitted to school. We feel quite strongly that no child should be pronounced immune to diphtheria until it shows a negative Schick reaction. We noticed no symptoms of anaphylactic schock in giving more than 100,000 injections of toxin-antitoxin. This was also true when repeated series of injections of toxin-antitoxin were given.

Kansas. In October, 1925, Dr. John L. Lavan, Commissioner of Child Hygiene and Communicable diseases and Dr. E. C. Black, physician to public schools, Kansas City, in conjunction and cooperation with the school board undertook to inaugurate a campaign for the prevention of diphtheria. Having a good understanding of conditions in the past, particularly with respect to contagious diseases, they estimated that if they could reach 20 per cent. of the total enrollment, they would have accomplished much. However, after checking tabulations, they found that they had nearly doubled this estimate. They encountered an immediate response from the people that was very gratifying and one which kept them very much occupied during the whole school year, especially as they were handicapped by lack of personnel and lack of funds.

Illinois. We might continue to give examples of this sort, but let us talk in terms of Illinois, for after all, we are primarily interested in the people of our own State. Possibly some of you will be surprised to hear what has been accomplished, through the cooperation of local physicians with Boards of Health, Parent-Teacher Associations, Women's Clubs, Boards of Education; through publicity (articles published in local papers, etc.); through the work of the public health nurses; by public talks (speakers sent out by the Educational Committee of our State Medical Society, by the State Department of Public Health, and by our County Medical Societies); by examination of the preschool child; by medical inspection of school children, and by films, posters, etc.

Diphtheria Drops Down-State—Up in Cook County. A statistical study made by the Department of Public Health shows that "Leaving Cook County out of consideration Illinois experienced its lowest loss from diphtheria last year. Forty-four counties escaped without a single death from that cause and the loss suffered by the others amounted to 150 fatalities compared with 160 in 1926. This amounted to a six per cent. decline in the number of deaths and gave a rate of 3.9 per 100,000 population. In 1926 the rate was 4.3 for the State outside of Cook.

Including Cook County the State suffered an increase of 57 per cent. in mortality from diphtheria during 1927. There were thirty counties in which increases were observed but the rise of 98 per cent. in Cook County was by far the most important factor in making the State average greater. This, of course, is due to the density of population in Cook County. In a number of other counties the percentage of increase was much greater than in Cook but the relatively small number of people concerned made the difference insignificant so far as the State rate is concerned.

In thirty counties the number of deaths increased and in thirty they decreased. No variation took place in 42 counties. Of these 26 were among the 44 which experienced no loss of life to diphtheria.

The most favorable conditions prevailed in the 33 northern counties with the exception of Cook. In that area, where the estimated population is 1,424,302 the number of deaths was 46 and the rate 3.2 per 100,000. The number of deaths in those counties in 1926 was 55.

The largest reduction took place in the 34 counties south of Montgomery. In that area the

number of deaths dropped from 65 to 51 and gave that group of counties a rate of 4.9 for 1927.

Menard and Stark counties each completed with 1927 a five year period without the loss of a single citizen to diphtheria. Six counties, Brown, Hardin, Johnson, Moultrie, Putnam and Wabash, have been free for four years. Bureau, Cumberland, Effingham, DeWitt, Greene, Lee, McHenry, Monroe, Ogle, Schuyler and Warren make up a group of eleven counties that have not suffered a death from diphtheria for three years. The two year group includes Carroll, Henderson, Iroquois, Ford, Gallatin and Jackson. All of these counties have an advantage in the fight against diphtheria because foci of outbreaks have been pretty well dried up.

In the 35 central counties the mortality from diphtheria went up from 40 to 53, yielding a rate of 4.4 for the section. The increase was confined almost entirely to Macon, Sangamon and Vermilion Counties where 18 more deaths from diphtheria were recorded than in 1926.

While no very accurate analysis of the data has been made it appears certain that the use of toxin-antitoxin has been promoted on a much larger scale in the northern and southern counties than in the central section of the State. Work in the southern territory has been particularly noticeable and apparently it has appealed to the public there in a more practical way than elsewhere. In a number of communities toxin-antitoxin has been given to practically the whole susceptible population. This is true of White, Lawrence, Edwards, parts of Wabash, Johnson, Jackson, Fayette, Christian, Champaign, McHenry, Du Page, Mason, Wayne and Massac. Doubtless this has been an important factor in the favorable experience with diphtheria.

TABLE 1

DEATHS AND DEATH RATES FROM DIPHTHERIA IN ILLINOIS

Year	No. Deaths	Rate per 100,000 Population
1921	1,478	22.2
1922	1,181	17.4
1923	811	11.9
1924	480	6.8
1925	409	5.7
1926	411	5.7
1927	647	8.8

TABLE 2

MORTALITY FROM DIPHTHERIA BY SECTIONS

Counties	Deaths					Rate
	1927	1926	1925	1924	1923	1927
33 Northern	543	306	325	333	543	10.9
Except Cook	46	55	55	86	129	3.2
35 Central	53	40	40	58	117	4.4
34 Southern State	51	65	38	79	140	4.9
	647	411	407	470	800	8.8

In 1926 there were 44 counties that escaped mortality from diphtheria entirely and in 1925 there were 42. The number to escape in 1924 was 31 and in 1923 it was only 12. Prior to 1923 very few counties in Illinois ever passed through a whole year without yielding some human life to diphtheria. Coincidently, the use of toxin-antitoxin was practically insignificant prior to 1923.

Mooseheart, Illinois. For the following statistics we are indebted to Dr. John D. Nichols, Director of Health and Resident Physician at Mooseheart, Illinois.

Prior to 1919, Mooseheart was never free from some cases of diptheria, at times developing epidemic forms. During the spring of this year (1919), Dr. Winner of the State Department of Public Health gave the Schick test to the entire student body, consisting at that time of something over 500 children. There was a large percentage of positives. We then disregarded the Schick test and immunized every student with three weekly injections of 3 plus L toxin-antitoxin, but did not Schick afterwards. We have been immunizing without Schicking every student immediately upon admission to Mooseheart as a part of their entrance examinations.

During 1920, we had two cases of diphtheria, one in a boy whom we had missed during immunization, and the other a boy who had very large tonsils and who had been immunized about one month previously. Since that time we had three employees who contracted diphtheria at different times and who were in direct contact with the children in their respective halls, but none of the children contracted the disease. Since 1920 we have had but one case of diphtheria among the children.

Soldiers' Orphans' Home, Normal, Illinois. From Dr. Ralph P. Peairs, physician for the Soldiers' Orphans' Home at Normal, Illinois, we quote the following:

In 1919 I decided to try out the Schick test, with the immunizing of susceptible children with toxin-antitoxin, in the Soldiers' Orphans' Home at Normal. Let us look at the condition of affairs as regards the prevalence of diphtheria in that institution during the time this work has been in progress. The disease appeared late in August, 1919, and for a period of five weeks there were fifteen cases. By culturing children and employees we found eight carriers during this time. Again in December, 1919, and for a period of six weeks there were twelve cases and one carrier. About this time the testing of the children by the Schick method was started and toxin-antitoxin given to all showing positive reactions. In July, 1920, it again appeared and during a period of four weeks there were ten admitted since the Schick tests had been done. All new children were tested at this time, and the positive cases immunized. In October, 1920, there were four cases during a period of two weeks. In December, 1920, two employees contracted the disease and four carriers were found. One of these was a child who had had the disease a year previous and the other three were employees. This makes a total of 45 cases and 13 carriers during a period of sixteen months. During 1921 we did not have a single case in the institution. All new children are tested and all positives are given three injections of toxin-antitoxin. We tested 600 children, of whom 266, or 44 per cent, were positive; 334, or 56 per cent, were negative:

TABLE 3—RESULTS OF TESTS

		Positive	Negative
Males	354	146	208
Females	246	120	126
	600	266	334

Perusal of the statistics has brought out some interesting facts and our results are in accord with other workers in this field. The youngest child tested was two months old and the reaction was negative. Children of from two to ten years showed the greatest susceptibility. Girls seem to be slightly less immune than boys. A few children who showed positive reactions were immunized and again tested several months later, and showed negative reactions. We have had one case of a girl of thirteen years who developed the disease a few days after the injection of toxin-antitoxin. This is in keeping with the theory that it requires two to three months after treatment before immunity is obtained. There was one case of a boy aged nine years who had three injections of the T. A. mixture in January, 1920, and who came down with a mild case of the disease in October, 1920. Attention has been called to the fact that in certain individuals three doses of T. A. mixture are not sufficient to confer immunity and additional doses are recommended in such cases. The fact that only one such case has developed among 246 children who have received three injections of T. A. shows that the method is of decided value.

For several years I have done no Schick testing but immunize all children. It was my plan to await until about 50 new children were admitted before immunizing them, as it saves some time. However, I found that an occasional case would develop among these children who had not been immunized. I have for the past six months immunized all new children within a few days after their admission and I have had no trouble in this way.

This is in decided contrast to the condition prevailing ten years ago. Then we were accustomed to expect 25-40 cases during the year, and epidemics were of frequent occurrence. It was always a source of worry to us. At the present time diphtheria does not worry us and we know if a case should develop there is no fear of an epidemic. Nobody can better appreciate the value of diphtheria immunization than a physician who cares for the children of a large institution especially if this population is a transient one.

In immunizing those who have shown positive reactions, three injections of T-A have been given, one week intervening between the injections. We have now given about 800 of these injections and there have been no alarming symptoms as a result. All of these children have complained somewhat of soreness and there has been considerable induration about the site of the injection. A few have been put to bed for one or two days, but nothing serious has resulted in any case, so we feel certain that the procedure is safe. One thing that was noticeable was the fact that the younger children did not show as much disturbance from the injections as did the older ones and the few infants to whom it was given showed the least reaction.

Insurance Company. The Metropolitan Life Insurance Company with Dr. Louis I. Dublin as statistician, in the *Statistical Bulletin* of the Company, July, 1927, states that the diphtheria death rate among children insured in that Company declined from 23.8 per 100,000 in 1921 to 9.5 in 1926. This is a reduction of 60.1 per cent., and is coincident with the increasing use of toxin-antitoxin.

Anaphylactic Reaction After Toxin-Antitoxin. Under "Queries and Minor Notes" in the *Journal A. M. A.*, December 17, 1927, two questions concerning the possibility of anaphylactic reaction following the use of toxin-antitaxin are answered as follows: "Practical experience indicates that there is little, if any, serious danger from anaphylactic shock and asthma from giving antitoxic serum to children who have been immunized with toxin-antitoxin." To obviate this slight danger the Illinois Department of Public Health now distributes T. A. made of goat serum instead of horse serum.

TABLE 4

DISTRIBUTION OF TOXIN-ANTITOXIN IN ILLINOIS

	Style A single Tr.	Style B three Tr.	Style C ten Tr.	TOTAL
July 1, 1922-June 30, 1923	4,106	....	2,433	6,539
July 1, 1923-June 30, 1924	588	....	1,147	1,735
July 1, 1924-June 30, 1925	793	....	2,513	3,306
July 1, 1925-June 30, 1926	1,069	....	2,679	3,748
July 1, 1926-June 30, 1927	436	8,209	5,674	14,319
July 1, 1927-Dec. 31, 1927	279	2,864	5,269	8,412

Total distribution: Style A, 7,271; Style B, 11,073; Style C, 19,715; Total, 38,059.

If our scientific facts and statistics as to the cause of diphtheria, its prevention by administration of toxin-antitoxin and use of Schick test to discover the susceptibles are correct—and they undoubtedly are—diphtheria is both a preventable and controllable disease. It should have a low mortality wherever competent physicians are available.

In order to accomplish this, the physician should begin to educate the parents almost as soon as the baby is born and to see that toxin-antitoxin is given during the first year of life, shortly after 6 months of age. To insist upon all preschool children being immunized against the disease. Above the age of 6 years the preliminary Schick test should be given whenever practicable.

All school children giving a positive Schick should be immunized with toxin-antitoxin. No child should be pronounced immune from diphtheria because of having received three immunizing injections of toxin-antitoxin. A subsequent negative Shick test is absolutely necessary before any one can properly make such a statement or issue a certificate to that effect.

Let us furnish a real public health service to our patients and their families and to our communities. We realize that the preschool child needs the protection conferred by immunization much more than the older child so let us cooperate with our local Parent-Teacher Associations and the Woman's Club at least in the program for the preschool child, which Dr. John M. Dodson of Rush Medical College, has said is one of the best and most far-reaching childhealth programs that has ever been proposed.

Let us keep in mind that a toxin-antitoxin campaign has for its ultimate purpose the making of immunity to diphtheria a private responsibility. We are endeavoring to acquaint the public with the fact that such immunity is obtainable, to offer convincing evidence of the efficacy and to provide a stimulus that will lead parents individually to have their children protected.

SUGGESTED OUTLINE FOR TALKS ON DIPHTHERIA IMMUNIZATION

In one county in the State where we were assisting the County Medical Society in launching a diphtheria immunization campaign we were asked to write an outline to be used by physicians when addressing a lay audience. This request was made in order that uniform statistics might be had.

1. What is diphtheria?
   Season of greatest prevalence, etc.
2. Is diphtheria curable?
3. What is antitoxin?
   When given?
   Will antitoxin prevent as well as cure diphtheria?
   Under what conditions should antitoxin be used as a preventive?
4. Is diphtheria preventable?
5. If so, why should it be prevented?
   One reason: Diphtheria continues to cause one-third of deaths in United States for children under 6 years of age and mortality in recognized cases is still 10 per cent.
6. Toxin-antitoxin.
   What is it?
   Ages to be given: (6 months to 6 years and at any age when Schick Test is positive.)
   Number of injections.
   Difference between toxin-antitoxin and antitoxin.
   Time necessary for T-A to become effective.
   How long does immunity last.
   Proof that T-A creates a relative permanent immunity. (Schick and Re-Schick.)
7. Schick Test.
8. Statistics on T-A and Schick.
   New York: Over 500,000 have been immunized. which means that substantially more than one million injections of toxin-antitoxin have been given. There have been no serious reactions.
   New Haven, Connecticut. Population, 175,000. 80 per cent of children immunized.
   1926—1 death.
   1927—2 deaths.
   Auburn, New York. Population, 37,000. 85 per cent of school children and many younger ones immunized.
   No deaths from diphtheria in 4 years.
   California:
   6,000 Schick Tests given to children in three counties, to inmates of four institutions and two groups of college students.
   Results: First work done February, 1922, in town of 1,340 population. In 13 months preceding there had been reported 44 cases of diphtheria and five deaths.

As a result of vigorous campaigns 90 per cent of population under 18 years given Schick Test and T-A.

Since this general immunization 1 case of diphtheria in Schick positive child whose parents refused T-A.

California School for Deaf and Blind:

No cases since 1922.

University of California:

Susceptibles—69.7.

San Jose Teachers College Training School:

Susceptible—81.4.

University of Minnesota:

During last 3 years 8,069 Schick Tests. 52 per cent reaction positive. Percentage higher among boys. Slightly greater amount of susceptibility among students from smaller communities than from the larger.

Detroit:

In few years of concerted effort reduced diphtheria deaths from rate of 35.6 per 100,000 population in 1921 to 9:5 in 1925.

Mooseheart, Illinois:

Enrollment about 1,500.

Medical director began T-A in 1920. One case of diphtheria since that time.

BIBLIOGRAPHY

American Medical Association Journal, November, 1922; November, 1927.

Illinois Health News, January, 1928.

Illinois Department of Public Health.

Statistical Bulletin, Metropolitan Life Insurance Co., July, 1927.

American Association for Medical Progress Journal, September, 1926.

California and Western Medicine, December, 1927.

Illustrative Charts from Division of Laboratories, State Department of Public Health.

DISCUSSION

Dr. A. L. Hoyne, Chicago: Mr. Chairman, after listening to the splendid paper of Dr. Ball, I wonder if any one could fail to be convinced that toxin-antitoxin absolutely prevents diphtheria. Diphtheria occupies a very peculiar position in regard to public health situations. It is peculiar perhaps from almost any other disease we have to deal with. There is probably no disease in regard to which our knowledge has been more complete than that in regard to diphtheria and yet year after year, as Dr. Ball has pointed out and as these charts show and as we all know, the death rate runs on very much the same. We get a dip for a few years, a decline in mortality, and then again we find that mortality is up. There ought to be some definite reason for that; there surely is a reason.

Perhaps the thing at the basis of all our trouble in this connection is, as some of us suspect anyway, the fault of the doctors themselves in not advising people, advising the families, to have their children given toxin-antitoxin.

Several years ago when Dr. Robertson was Health Commissioner, he was very much interested in this problem and along in 1917 he decided to attack it from an angle somewhat different than might ordinarily be taken. He thought if he sent out a great deal of literature to the doctors, perhaps it might be placed on their desks and eventually find its way into the scrap basket because the men were very busy and they might not have time to read it.

So instead of going at the problem in that way, he thought he would try to arouse interest in people who were not doctors in order that they might inquire of doctors something in regard to toxin-antitoxin. One thing that he did was to place an easel in the City Hall with two large letters on it. The letters were simply T-A.

Naturally people came along, thousands of people passing back and forth, and they glanced at these letters and wondered what they meant. Nobody seemed to know. Finally one day a reporter stood and listened to the comments and he heard someone say that the Health Commissioner knew something about it, so the reporter went to the Health Commissioner to inquire if he did know anything about it. He said he had been standing in the hall listening to the comments of the people and that the majority of them had agreed that these two letters, T. A., stood for Thompson Administration.

About that same time, in 1917, we though it would be a good plan at the Municipal Contagious Disease Hospital to try to immunize all the nurses who had positive Schick tests. After attempting to do this with a few, we stopped because we found that in the adults the reaction was often very severe—that is, the local reaction especially.

Besides that, the preparation that was put out at that time was probably not as carefully prepared as it is in the present day. At any rate, as Dr. Ball pointed out, the younger the indvidual is who receives the toxin-antitoxin, the less likelihood there is to be any severe reaction. Certainly a child a year of age given three doses of toxin-antitoxin will very seldom suffer any ill consequences as a result.

When you go into some institution and attempt to Schick individuals as they do in some of the hospitals in regard to nurses, I think it depends a lot on who does the Schicking and it also depends a great deal on who reads the interpretations. It depends somewhat, too, on the material that is used.

Dr. C. Martin Wood (Decatur): One thing that should be emphasized is that no one agency is going to put this campaign over. We have had some experience with this down in Macon County and we find that you can't do it all through the school, you can't do it all through the doctors; that you have to have a combination of a good many different agencies to put this over.

The doctors can get their own patients and that still leaves some open. The school can get the children of six years old and over—a very important group of children of pre-school age is left, and that is really where the toxin-antitoxin is most needed.

We have tried offering free antitoxin treatments to all those who weren't able to pay for it; told them to come to the hospital a certain day, and out of a

population of sixty thousand people only fifteen children presented themselves the first day for the toxin-antitoxin. So I think it will have to be through a thorough organization and publicity more than anything else.

Our County nurse now has several dozen schools in the county that are a hundred per cent protected just through her own initiative. She started and got the children in the country schools to take it up and she has several schools where all the children have had the toxin-antitoxin. It certainly is something that should be pushed by every doctor and all public health agencies.

Dr. Ball: I am very glad that Dr. Wood brought up the matter of general cooperation of everybody in the community. That is true. There isn't any one individual agency that can put this over; it does take general cooperation.

I also want to call your attention to the importance of the pre-school child program as emphasized by Dr. John A. Dodson of Rush Medical College. He feels it is one of the most important health activities that has come up in recent years.

ALBUMINURIA IN CHILDREN*

JOSEPH K. CALVIN, M.D.,

CHICAGO

The significance of albumin in the urine of apparently healthy children is still the subject of much discussion. Most of these cases are accidentally discovered in the routine examination of urine in schools, orphan asylums and dispensaries.

It is not our purpose in this paper to repeat the study of large groups of children to determine the incidence of albuminuria, but intensively to study small groups with the objective of throwing some light on the cause, or causes, and significance of the condition.

However, the incidence of albuminuria in 5,000 school children has been so thoroughly investigated by Lauener that we feel justified in summarizing parts of his work in table 1.

Table 1.—Summary of Lauener's Cases of Albuminuria in Five Thousand School Children

Age	Number of Children	Percentage Showing Albuminuria	Percentage of Boys with Albuminuria	Percentage of Girls	Percentage Showing Trace of Albumin	Percentage Showing + + or More
6- 7	1,246	6.7	5	8.5	5.6	0.2
10-11	1,350	27	18.6	35.5	15.6	5.7
15-16	2,481	38	29.5	46	25.5	3.2

Because of the confusion in the literature regarding the etiology of the so-called benign albuminurias, we have attempted to determine the causes by analyzing two groups of children of very different environmental and physical conditions. Dr. Jacob Meyer and Miss Bertha Isaacs were co-authors in this work.

One of the groups studied was composed of children having no special complaints or illnesses. They were recruited from the homes of the very poor in which hygienic conditions were at their worst, diets were improperly balanced and teeth, tonsils and other potential foci of infection neglected. Consequently, undernourishment and anemia were common. This group will hereafter be designated as group 1.

The second group studied consisted of children living in a well regulated orphans' home under the supervision of a watchful physician. Their hygienic surroundings were very good. They lived a well regulated life with the proper balance between school work, play, recreation and rest. The meals were properly balanced. Foci of infection were eliminated as soon as discovered. Periodic physical examinations were made. This group will hereafter be known as group 2.

The results of the urine examinations are shown in tables 2 and 3.

Table 2.—Data in Cases Presenting Aluminuria in Five Hundred and Twenty Children Examined (Morning Specimens Used)*

Group	Number of Children Examined	Boys	Girls	Age Range	Average Age	Percentage of Total Showing Foci of Infection	Total Percentage of Albuminuria	Percentage Boys	Percentage Girls
1	189	103	86	2-16	8	63	60†	45	70
2	331	181	150	6-16	11	0	15	10	20

*The microscopic findings were abnormal in less than 1 per cent of the cases.

†Eighty per cent of the total albuminurias (60 per cent) showed evidence of malnutrition and foci of infection.

Table 3.—Results of Reexamination of Same Cases Over a Period of One Year

Group	Number of Children Examined	Boys	Girls		Total Percentage of Albuminurias	Percentage Boys	Percentage Girls
2	331	181	150	6 months later	24	20	30
2	331	181	150	1 year later	15	9	22

From these observations we conclude that the incidence of albuminuria is much higher in children living under poor hygienic surroundings, having many foci of infection (untreated) and for the most part being anemic and undernour-

*Read before the Clinical Section of the Illinois State Medical Society at the Cook County Hospital, May 10, 1928.

ished. That these factors do play a prominent role in the causation of so-called benign albuminurias in children is evidenced by the fact that many respond to the treatment of these etiologic factors, as will be described later.

The orphanage children (group 2) have a minimum of these factors present. Lest our conclusions be misinterpreted, we wish to repeat that the findings of carious teeth, enlarged and infected tonsils and adenoids, or infected nasal sinuses merely add to the picture of a child below par physically and are not, so far as we can determine, the specific causes of the albuminuria. We feel that the correction of such defects results in an improvement of the albuminuria, mainly so far as it helps to produce a general improvement in the condition of the child.

Idiopathic or "Growth" Albuminuria. Albumin may appear a considerable time before puberty, but it reaches its greatest incidence during adolescence, the period of greatest growth. Lauener has used the term "growth" albuminuria. He is of the opinion that growth, with its attendant phenomena, is a factor in the albuminuria of juveniles. As it is more frequent in girls than in boys, this may be attributed to their more rapid and intensive growth. We wish to direct attention to this and to point to our experiences with the orphanage children. Here are children in whom all foci of infection have been removed, who to all appearances are normal and well nourished, and whose weight curves show a definite increase, and yet, a small but fairly constant percentage manifest benign albuminuria. It would seem that 78 per cent. of the albuminurias in the orphanage children would fit into the group classified as "growth" albuminurias. The remaining 22 per cent. were of the orthostatic type (table 4).

The albuminuria in many of the cases studied was transitory in character, as revealed by repeated urine examinations. In group 1, on sixty-five of the 189 children studied, from two to six urinalyses were made over a period of one year. Forty of the sixty-five varied from positive to negative and back to positive or negative again. In group 2, fifty of the 331 urines examined were positive on the first examination. One week later, of the same fifty, only forty-three were positive for albumin, and six months later, only twenty-one of the original fifty albuminurias were still positive. Also sixty-two cases in which the first examination was negative showed a positive urine six months later.

Orthostatic Albuminuria. Many observers have maintained or implied in their writings that the non-nephritic or benign albuminurias found in urines on routine examinations are based on an orthostatic or postural albuminuria.

From our studies we believe that most of the so-called benign albuminurias in children are not of the orthostatic type. By orthostatic albuminuria we understand a condition in which the urine excreted while the patient is lying down is albumin free, with the subsequent appearance of it after he rises. In short, if the first specimen passed in the morning, when compared with a specimen obtained later in the day, after normal activities, contains as much albumin or more, then the condition does not belong in the category of the orthostatic albuminuria.

We examined the afternoon urine specimens in group 2. In those found positive, the first specimen passed in the morning (night urine) and an afternoon specimen were reexamined. The results are summarized in tables 4 and 5.

Table 4.—Comparison of Morning and Afternoon Urine in Cases in Which the Afternoon Specimen Had Been Found Positive

Total Number of Cases in Which Afternoon Specimen Had Been Found Positive	Total Percentage of Orthostatic Patients Among the 32 Albuminurias (in the 249 Children)	Percentage of Orthostatic Patients Among the Total Number of Children (249) Examined	Percentage of the 12* Boys Negative in the Morning and ++ or More in Afternoon	Percentage of the Total Boys (138) Examined Negative in the Morning and ++ or More in the Afternoon	Percentage of the 20* Girls Negative in the Morning and ++ or More in the Afternoon	Percentage of the Total Girls (111) Examined Negative in the Morning and ++ or More in the Afternoon
32	7, or 22%	7, or 2.8%	4, or 33%	4, or 2.9%	3, or 15%	3, or 2.7%

Boys 12* Girls 20*

Table 5.—Data of Albuminuria in Afternoon (Late Afternoon Specimens)

Total Number of Cases	Percentage of Total Positive in Afternoon	Percentage of Total Boys (138) Positive in Afternoon	Percentage of Total Girls (111) Positive in Afternoon
249	32, or 12.8%	12, or 8.2%	20, or 18.9%

Boys 138 Girls 111

We believe our results indicate that the greater percentage of albuminurias in children are not the postural or orthostatic type. We admit, however, that at times it is difficult to differentiate between a so-called growth albuminuria and an

orthostatic albuminuria, especially as one may merge into the other; but we feel that postural relationship is the most definite constant characteristic of the orthostatic albuminuria. Whereas some would assign a greater proportion of benign albuminurias to the orthostatic variety, we are more inclined to separate this group and to add that the greater proportion of benign albuminurias in children are due to the asthenia and anemia resulting from foci of infection and to growth disturbances.

Type of Protein. Until the recent work of Welker, it was generally agreed that the protein in the urine might be identified as either serum albumin or serum globulin, also referred to as euglobulin, or a combination of the two. Langstein and Wallis concluded that the protein precipitated by acetic acid added to cold urine was euglobulin, while Pollitzer believed that the precipitate was caused by a combination of serum albumin and chondroitin-sulphuric acid. The precipitate is often referred to as the acetic acid body. Welker's investigations disclose, however, that chemical tests for the identification of the types of protein in urine are difficult of application and interpretation, but that the precipitin test accurately identifies most of the proteins. By means of the precipitin test he found that the protein in urine may be identified as coagulable protein not precipitated in the cold by acetic acid (serum albumin, pseudoglobulin); or coagulable protein precipitated in the cold by acetic acid (mucin, nucleoprotein), and noncoagulable protein not precipitated by acetic acid at all (proteoses). There is no simple test for separating euglobulin, mucin and nucleoprotein available. All of these are precipitated in the cold by acetic acid.

The results of our investigations of the types of protein present as determined by the "cold" and "heat" acetic tests are given in table 6.

Table 6.—Results of Investigations of Types of Protein

Total number of urines analyzed	906
Total number giving a positive protein test on the addition of acetic acid to the cold urine	248, or 27.4%
Total number giving a positive protein test on the addition of acetic acid to the heated urine	398, or 43.9%
Total number agreeing in both the cold and heated specimen (either positive or negative)	646, or 71.3%
Total number more positive in the heated than in the cold	238, or 26.6%
Total number more positive in the cold than in the heated	20, or 2.2%
Total number positive in the cold only	18, or 1.99%
Total number positive in the hot only	163, or 18%

We concluded from these results that 26 per cent. of the urines examined and 58 per cent. of those showing a positive protein reaction contained either euglobulin, nucleo-albumin, mucin, or all of them, which precipitate out when acetic acid is added to the cold urine. As 26 per cent. of the total were more positive in the hot urine, it is reasonable to assume that, at least in this number, serum albumin or psuedoglobulin, or both were present, as this percentage reacted only in the heated urine. In two-thirds of the analyses, the heat and cold test agreed (either positive or negative). In this series, 46 per cent. of the total gave a positive protein reaction.

It appears from these results that either euglobulin, nucleo-albumin and mucin, or all, are prominent components of the protein in the urine in the benign albuminuria cases, but that serum albumin or psuedoglobulin may occur alone, even in benign albuminurias. Only by further investigations by means of the precipitin test can it be determined which one of the three proteins, euglobulin, nucleo-albumin or mucin, predominates in these benign albuminurias.

SUMMARY AND COMMENT

All previous investigators agree that albuminuria is a frequent occurrence in children, especially in those over 6 years of age, becoming more frequent toward puberty. Most agree that the incidence is higher in girls. Globulinuria is generally accepted as a type of proteinuria that predominates, or is a prominent feature in these cases. Some authors maintain that most of these juvenile forms of albuminuria are of the orthostatic or postural type. Others contend that the majority are not of this type but nevertheless are harmless and of not as much importance as is customarily attached to them. Many cases have been followed into adult life and have shown no higher incidence of nephritis. It is generally agreed that the growing kidney may physiologically secrete albumin in the urine, and consequently during the period of most rapid growth (puberty) the greatest incidence occurs.

As a result of our studies, we believe that some of these albuminurias may be considered physiologic or growth albuminurias, but that many other etiologic factors may be present, which, when removed, result in the permanent disappearance of the condition. One of us has

conducted an albuminuria clinic for several years for the purpose of finding the cause and eliminating it if possible in these cases. Foci of infection, especially chronically infected tonsils, adenoids, nasal sinusitis and abscessed teeth, are the chief offenders. Many cases of albuminuria have responded when treatment was directed toward these foci. Again, undernourishment and anemia often were associated with albuminuria, which responded to the overcoming of these factors. We reiterate that we do not believe that all of these factors (foci, etc.) have any direct specific effect on the kidney. They probably are a part of the picture associated with malnutrition or an under par condition with faulty blood volume and blood flow, resulting in hypofunction or impaired function of the body tissues. In short, the albuminuria is merely one symptom of a general systemic disturbance in these cases.

We wish to direct attention to the dangerous practice of stressing the term albuminuria too greatly to the parent or to the child. The harm done psychically may be worse than the condition physically. Albumin in the urine is a dreaded occurrence among the laity, and albuminuria neurotics can easily be created. The "disease" often occurs only in the physician's test tube and in the mind of the patient. However, these simple benign albuminurias must not be totally disregarded. A functional albuminuria should be regarded much as a functional heart murmur. Every case should be under the control or observation of the physician for a variable period, certainly during the period of adolescence, and for a short period following.

We offer the following classification for convenience, thus doing away with a host of misleading terms:

Benign Albuminuria:

(a) Malnutrition albuminuria, frequently associated with anemia, underweight and systolic basal murmur. Foci of infection, especially infected tonsils, adenoids, nasal sinuses and carious teeth, are common causes of this malnourished condition.

(b) Orthostatic albuminuria, associated with posture.

(c) Idiopathic or "growth" albuminuria, including the terms juvenile, puberty, cyclic, transitory and intermittent.

According to our experience, the simplest methods of treatment should be followed. We would recommend first an intelligent explanation of the nature of the findings to the parent, explaining the simplicity and benignancy, and that it does not comprise a sickness or disease. Those cases which demand correction and elimination of apparent foci of infection certainly should have these done. Nutrition should be improved and anemia overcome. But we do not advise any excessive rest cure or restricted low protein diet as a remedy. Such measures may actually result in harm to children who are physically under par. The child should be allowed to lead a normal life with only such restrictions as are necessary to overcome any malnutrition; otherwise, freedom in every regard has proved to be the best remedy. Especial emphasis should be laid on the physical development of the orthostatic group.

ESOPHAGEAL OBSTRUCTIONS CLINIC*

FRED M. DRENNAN, M. D.,
and
FRANK C. VAL DEZ, M. D.
CHICAGO

We realize that diseases of the esophagus are relatively rare, but because the function of the esophagus is to carry food from the mouth to the stomach and keeping up nutrition by the entrance of food through other channels is unsatisfactory, we feel esophageal disease, though rare, is of considerable importance.

In considering diseases of the esophagus, one should keep in mind the anatomy, physiology and relation to surrounding organs. The gross anatomy is relatively simple, the esophagus being a relatively long and narrow tube beginning opposite the upper border of the cricoid cartilage about six inches from the incisor teeth. It is about sixteen inches in length in an adult, passes through the thorax and enters the stomach about one inch below the diaphragm. There are three points at which there is a relative narrowing of the lumen, the beginning of the esophagus where the left bronchus crosses, and where the esophagus penetrates the diaphragm. These points are the site of most usual pathology. The narrow lumen is easily closed so that practically

*From Department of Medicine, Loyola University.

all pathological conditions result in obstruction and the patient is unable to swallow food. The wall of the esophagus is made up of a mucous membrane lining filled with secreting glands and muscle coats of circular and longitudinal fibers.

The physiology is the act of swallowing and is accomplished by a progressive peristaltic action, the circular fibers at the lower end acting as a sphincter and causing a temporary delay of the food just before it enters the stomach. This is mentioned as it is possibly the cause of irritation which influences the development of malignancies at this point and when exaggerated gives the more marked spasm of cardiospasm.

The anatomical relationship of the esophagus to the trachea, lobes of thyroid, left bronchus, aorta, thoracic duct, etc., and to pathological conditions such as aneurysms, abscesses in throat and mediastinum, etc., make it necessary in one's examination and treatment to be absolutely sure that the patient is not to be injured more than benefited by our manipulations, so in using tubes, bougies, esophagoscope and even fluoroscope, great care is necessary as rupture of the esophagus with infection of the non-resistant mediastinum is practically always fatal. The lesions of the epsohagus are of the usual classification—congenital and acquired.

Congenital Lesions. Congenital lesions vary from a narrowing of the lumen to complete obstruction with absence of lumen for a considerable distance.

Case 1. Our first case is that of a boy who came to us when three years of age, complaining of regurgitation of food which had been present since birth, coming on as soon as food was taken, worse with solids than liquids, though everything caused trouble. Careful diet as prescribed by pediatricians had failed to help. He was markedly emaciated; showed all symptoms that go with under nourishment. There was no history of swallowing foreign body or escharotics and symptoms began in first weeks of life. Wassermann was negative. Bougie and tube were obstructed at about level of bifurcation of trachea and barium was held at same level. This definitely is a congenital deformity which did not completely obstruct. The method of dilating used was that developed by Dr. Bertram W. Sippy. It consists of having the patient swallow a small silk thread which has been waxed to prevent untwisting and knotting. Usually it is necessary to have at least three yards swallowed so that the lower end is well down in the small intestine and consequently so fixed that it can not be pulled out. We have found by experience that this thin Corticelli silk thread will pass through any opening that will allow water to trickle through so that even the patients with very tight obstructions are able to get it through if they persevere in the attempt. The string is used as a guide and along it the wire is inserted. The wire is of flexible steel with a small bulb screwed and soldered to the small caliber end. This bulb has an opening in its center through which the string is threaded. The dilating bulbs are arranged in sequence on the wire, a small one first, gradually increasing in size so that the center bulb does the dilating and a similar series turned in the opposite direction allows for a safe and harmless removal of the dilating outfit. The bulbs are then pressed along the wire through the obstruction by a spiral. The safety of this method lies in the fact that the string has to follow the opening, the wire of necessity must follow the string through the opening and the dilating bulbs must follow the wire, thus assuring us against false passage and giving a maximum lateral dilation with a minimum danger of perforation. This boy has been dilated to date, has had a normal development and has very little difficulty in getting ordinary foods through. Plate I.

Fig. 1. Congenital Obstruction. Case T.

Acquired Lesions. Acquired lesions, if we make our list complete, should include:

1. Inflammations caused by chemical or mechanical agents plus infections with resulting reaction and scar tissue formation.

2. Some special inflammations as tuberculosis, typhoid, syphilis, thrush, etc., uremic ulcers, occasional peptic ulcers, etc.

Diverticula, divided into three types: 1. pres-

sure diverticula, 2. traction diverticula and 3. pressure-traction diverticula types. The first, pressure diverticula, occur high upon the posterior wall just below the junction of the pharynx and esophagus where the muscle coats do not completely surround the tube. They may be large enough to cause obstruction by pressure. The traction types are usually in lower portion of the esophagus and are result of contraction of inflammatory tissue, glands, etc., and usually are found during fluoroscopic examination and do not cause symptoms. Certain diverticula are a result of both factors and are logically called pressure-traction type.

Case 2. Our second case came to us with a history of difficulty in swallowing which had been present for a year, gradually getting worse, with milder symptoms for a long time which were so slight that they were not considered of any importance. He noted a sensation of food sticking high up in the esophagus, the sensation getting worse as he continued to eat until there would be a regurgitation of food with a peculiar crowing sound. He had brought up food in this way that had been eaten 24 hours before. Condition was made worse by excitement. He had lost 40 pounds in weight and was definitely weak. No tumor masses or glands noted in neck. Physical examination essentially negative except for difficulty in swallowing, a

Fig. 2. Diverticulum-Pressure Type. Before Operation.

definite fullness above left clavicle to left of midline on swallowing and a regurgitation of food quickly after its ingestion. Patient was x-rayed early in examination because the type of difficulty, the crowing sound on regurgitation, the pouching above clavicle and the retention of food spoke for a diverticulum. At fluoroscopic examination we found the large pouch as seen in plate 2; under fluoroscope, stomach tube and bougies could be passed through the esophagus into the stomach. This was done under direct observation because if the opening into the pouch had been large enough to allow entrance of the tube, slight pressure might rupture sac and cause serious infection. Patient swallowed the silk thread, as described in first case.

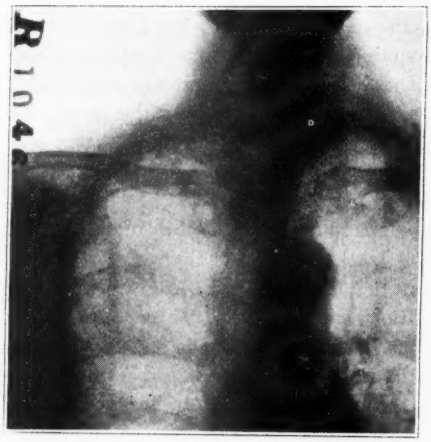

Fig. 3. Same as Fig. 2. After Operation, showing still a small retention.

and large bulbs were passed, proving that the difficulty in swallowing was not due to anatomical narrowing of the lumen but to pressure obstruction by the filled pouch. Diverticulae of small size are usually causing so little trouble that operative procedure is not justified, but this man was having so much trouble that operation was advised.

There is always a tendency for the surgeon to feel that radical removal should be done because of the ease with which the sac can be isolated and perhaps the anatomical comparison to an ordinary hernial sac, but experience has shown that removing a diverticulum will be followed fairly regularly by leakage, mediastinitis and death, so more conservative measures are advisable, such as two-step operations with the sac exposed till adhesions are formed and then removed, or the invagination operation as sponsored by Drs. Sippy and Bevan, care being taken to fix the invaginated mass so that it will not be forced into the esophagus and interfere with respiration or cause an obstruction during convalescence.

The invagination method was used in this case, Dr. Bevan doing the operation. Patient made an uneventful recovery and has had no difficulty in swallowing since. Plate 3 shows present condition of esophagus.

Case 3. Diverticulum high up in esophagus, small in size, causing only a regurgitation of food, but no pain, and not being enough inconvenience to justify operation with its attendant dangers. (Plate 4.)

Case 4. A traction diverticulum at the lower portion of esophagus, found in a patient who came to us with a duodenal ulcer. This diverticulum was not caus-

ing any symptoms and was found only in routine x-ray examination. This was probably a result of contraction of healing mediastinal glands which were attached to the esophagus wall. (Plate 5.)

Fig. 4. Small Diverticulum. Not enough symptoms to justify operation.

4. Cardiospasms—usually at the lower end of the esophagus, occasionally at beginning.

Case 5. Patient has had difficulty in swallowing for years; came on while eating; worse if excited; noted

Fig. 5. Traction Diverticulum, lower portion esophagus.

first as a feeling of pressure in the lower portion of esophagus. Regurgitated food showed no digestive change and did not taste sour or bitter. He had noted a 48-hour retention. Cold and liquid foods caused more trouble than warm and solid foods. Condition was intermittent in type, at times being absent for several days, but of late months giving practically constant difficulty. The treatment here varied only in the dilating apparatus. The string was swallowed in the usual way, the wire passed along it and a bag approximately 6 inches in length connected by tube with a pressure bulb and mercury monometer passed along the wire until it was located so that middle of the bag occupied the cardiospasm, as seen by fluoroscopic examination. With the bag in place, a measured amount of pressure can be used in dilating and the bag can be made to vary in diameter if the first and smaller stretching are not sufficient to give results. (Plate 6.)

5. Obstructions, scar tissue from a variety of escharotics, chemical, mechanical and thermal.

Case 6. A history of swallowing lye when a child. Severe acute pain, spasm at once and inability to take food. Gastostomy was done almost immediately and no dilatation attempted for 4 or 5 years. The obstruction was complete enough so that at no time could any

Fig. 6. Large dilitation from cardio spasm.

barium be seen to trickle through the esophagus. A string could not be swallowed. Esophagoscopic examination could not locate the opening so dilatation was not attempted. (Plate 7.)

6. Tumors—usually carcinoma, occasionally sarcoma.

Case 7. A man, 56 years old, came to us with a history of difficulty in swallowing, present for four months, first noted with solid foods but gradually getting worse so that at a time of first examination he could get only small amounts of water through. He was emaciated, showed occult blood in every bowel movement, had a secondary type of anemia and negative Wassermann. Bougie met with obstruction 14 inches from incisor teeth and x-ray showed barium retention with the lower edge of barium shadow being markedly irregular as seen in Plate 8. This is the location of about 50 per cent. of esophageal cancer.

Case 8. A man of 50, who had difficulty in swallowing for three months beginning with choking on a piece of meat, but at the time of first examination

was able to get only small amounts of water through. He had lost weight and strength rapidly; was very much dehydrated; Wassermann negative; blood pressure of the stomach involving the esophagus and causing the obstruction.

Fig. 7. Dilated esophagus above. Lye stricture.

The malignancy cases are dilated as described in the first case, care being particularly necessary not to attempt too rapid dilatation, as friable cancerous tissue is easily torn and rupture of the esophagus in such cases is always serious. We are usually able to get a large enough opening so that starvation or dehydration is prevented.

The three cases were treated by the method described for the congenital obstruction. In each of the cases the string was swallowed with some

Fig. 9. Esophageal Carcinoma.

ent in bowel movement. X-ray examination showed obstruction (Plates 9, 10) located at about the bifurcation of the trachea, the next common location for esophageal cancer (40 per cent.).

Case 9. A woman, 48 years old, who had been having difficulty in swallowing for two months, so severe

Fig. 8. Esophageal Carcinoma.

that she felt she was starving to death. Bougie met with obstruction 15 inches from incisor teeth, which we felt should be at lower end of the esophagus. She had negative Wassermann, positive blood in bowel movements ,and had lost rapidly in weight and strength. She had a definite epigastric tenderness and rigidity. Though a mass could not be palpated, x-ray revealed an infiltrating mass along the lesser curva-

difficulty, but after it was done, dilatation was accomplished and large enough opening made so that liquids could be swallowed readily, semi-solid foods easily and some solid foods without great difficulty.

Surgery of the esophagus is very difficult and unsatisfactory. Radium in malignancy is of questionable value; deep therapy in scar tissue and in our congenital obstructions of no value. Since the function of the esophagus is to allow the passage of food and water, we have felt that the wire and dilating outfit designed by Dr. Sippy furnishes the best method of treating these cases. To recapitulate, briefly the method requires the patient to swallow a silk thread, waxed to prevent kinks and knots, until it becomes fixed in the intestine. This is used as a

guide for the wire and insures us against false passage as no other method does. A gradual wedge of bulbs is then placed on the wire, both for dilatation as the wedge enters and for safety as it is withdrawn. This wires makes the use of a considerable pressure possible. The graduated bulbs make a lateral dilatation without tearing. The flexibility of the outfit makes it possible to follow a torturous path safely and withal gives us the maximum amount of dilatation with a minimum amount of danger, and makes it possible in our first case to keep him living a normal life. The same in scar tissue cases and in neoplasms to keep them happy, fairly comfortable and able to swallow food and fluid until metastases have caused constitutional symptoms.

Fig. 10. Esophageal Carcinoma.

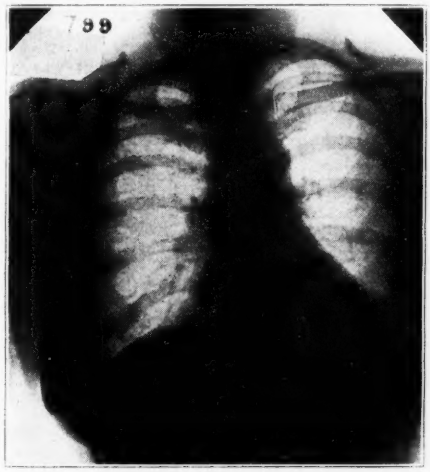

Fig. 11. Induration of lesser curvature of the stomach causing esophageal obstruction.

RECTAL DRAINAGE OF PELVIC ABSCESSES OF APPENDICEAL ORIGIN, WITH REPORT OF A CASE

AIME PAUL HEINECK, M.D.
Surgeon to the Francis Willard, St. Paul, Lakeside and Washington Park Hospitals
CHICAGO

In both sexes and at all periods of life, the appendix vermiformis, irrespective of its size or of its location, abdominal, pelvic or extraabdominal can be, and frequently is, the seat of an inflammation, evoluting to the stage of suppuration. Abscesses varying in size, number and location can result from suppurative or perforative appendicitis. In the cases in which the pus has accumulated in the cavity of the appendix, operation reveals the presence of an empyema of the appendix. In other cases the pus forms one or more small abscesses in the appendiceal wall or may infiltrate the entire thickness of the latter (phlegmonous appendicitis). An acutely inflamed appendix, gangrenous, perforated or nonperforated, can lead to a suppurative peritonitis, localized or diffuse. Should the purulent exudate be non-encapsulated, diffuse peritonitis is the resultant. If the pus be walled off by the abdominal wall loops of gut or other viscera a peri- or para-peritoneal abscess is the resultant.

The appendix has been found in all parts of the abdominal and pelvic cavities; it may be intra-peritoneal, extra-peritoneal or partly intra- and partly extra-peritoneal in location. The direction of the appendix with reference to the cecum is variable, its terminal end may point upward, downward, inward or outward; it may descend into the true pelvis. These anatomical considerations enable us to understand why non-embolic abscesses secondary to appendicitis have been found in so many various parts of the abdomen. The appendix may be merely contiguous to an abscess of appendiceal origin or it may, as it were, bathe in it.

Usually appendiceal abscesses are confined to the immediate vicinity of the appendix; in numerous cases, however, the pus, guided by agglutinated loops of gut and protective omental

adhesions, gravitates to distant regions in the lower abdomen and true pelvis and there sets up one or more walled-off abscesses. Abscesses of appendiceal origin are usually intra-peritoneal, may be sub-peritoneal. When located in the cul-de-sac of Douglas, the pus collection pushes back the anterior rectal wall and corresponds anteriorly, in men, to the urinary bladder; in women, to the uterus and the vagina. Loops of gut, matted together, with or without omental adhesions, form the dome or roof of the abscess and prevent the escape of the pus into the free peritoneal cavity.

Schrager, in reviewing this subject in 1916, said that suppurative appendiceal processes may spread backward and upward (the lumbar or post-parietal type of abscess) or upward and forward (the antero-parietal type), or downward (the rectal or pelvic type). It is with this latter recto-pelvic type of appendiceal abscess, rarely discernible by abdominal palpation, but always detectable by rectal examination, located wholly or in part in the lesser or true pelvis, that I especially wish to deal in this paper, in connection with a personal case which I will presently describe.

Though it is an established fact that a large proportion of appendiceal abscesses are pelvic in location, text-books rather ignore pelvic abscesses of appendiceal origin. Royster[2] in his book on appendicitis merely observes that the typical pelvic abscess may result from the localization of a diffuse peritoneal infection, may follow extension from the right iliac fossa of an abscess connected with the appendix, or may be due to a leaking pelvic appendix.

Etiology of Appendicular Pelvic Abscess. Although pelvic appendiceal abscess is usually referred to as originating from an acute appendicitis and soon after the latter's onset, there is apparently no reason why it should not also follow a sub-acute or chronic process; it may occur previous to or soon after an operation for appendicitis. (15th post-operative day in Patel's Case.[24]) The appendix proper may have been dealt with by operation in the usual classical way, but the exploration may have been too limited and the extension of the inflammatory process to the pelvis may have been overlooked, or else in the case of an inferior pelvic collection of pus the classical abdominal drainage of pus has proven inadequate. Symptoms of a pelvic abscess may, therefore, appear in the days or weeks following an appendectomy. In four cases following appendectomy, reported by Schrager, the symptoms of pelvic abscess first appeared in from 10 to 21 days following operation. I have recently had a very similar personal experience; and, as cases of appendiceal pelvic abscess drained through the rectum are infrequently met with in the literature, I think it worth while to report the clinical experience. My case is as follows:

On December 5, 1927, Otto Zezl, white, aged 27 years, was admitted to the West Side Hospital. He presented all the symptoms and signs of acute appendicitis and was subjected immediately to operation. The appendix, acutely inflamed and gangrenous (for about an inch at its distal end), was removed easily and rapidly by Dr. T. J. Echerer and myself. The scant peritoneal exudute present was mopped and the wound closed.

The first five post-operative days were uneventful. On the morning of December 10 the patient refused his breakfast and for the first time complained of pain in the abdomino-pelvic region; tympanites was present but careful and gentle palpation of the abdomen failed to detect any localized mass. On the 11th the abdomino-pelvic pain had increased, the mouth temperature was 102F. On the 12th, the patient was very sick and the temperature was 102F. Diarrhea now set in; the usual anti-diarrheic measures failed to check it. On the successive days the pain, tympanites and diarrhea increased (12 liquid stools on the 16th). Rectally the examining finger could easily detect a soft, fluctuating, extremely tender mass bulging into the lumen of the gut. General abdominal distension was present.

On the morning of the 17th, the patient was taken to the operating room. Under nitrous-oxide anesthesia the anus was dilated and the rectum copiously irrigated. After the bulging pus collection had been definitely located by inspection and by palpation it was punctured with the pointed end of the scalpel. An 8-inch forceps with its blades closed was introduced into this puncture opening; the blades were then opened and kept open as the forceps was withdrawn. Over one quart of foul smelling, thick pus escaped through the opening thus made. A gauze drain was inserted in the abscess cavity. The patient was then taken back to bed. On the following day the temperature was normal and the gauze was removed. Five days later, the symptoms having completely disappeared, the patient was discharged from the hospital and went home. Recovery was permanent.

Frequency of Apendiceal Pelvic Abscess. Though these abscesses are frequently overlooked, misdiagnosed and mistreated, there is no dearth of literature on the subject of pelvic abscess of appendiceal origin. Bérard and

Patel,[3] Rotter[4] and others have treated this entity fully in their classic articles with special reference to appendiceal abscesses which point toward the rectum.

Archibald, in 22 cases of appendiceal abscess, found that 7 were in the pelvis. Rotter collected 132 cases of appendiceal abscesses from the literature and found that 40 were pelvic abscesses. Of these, 7 were in the lesser or true pelvis and could not be palpated through the anterior abdominal wall. Sprengel[13] found 7 pelvic among 127 cases of appendiceal abscesses. Bérard and Patel[3] collected 44 cases of appendiceal pelvic abscesses, including 24 personal cases, all of which had been drained through the rectum. L. E. Schmidt[7] reported 6 cases of pelvic pus-collections, which he considered consecutive to appendicitis. All of Schmidt's patients were males.

Condamin[8] believes that the direct or indirect propagation of appendiceal inflammation to the pelvis and the formation of Douglas or para-Douglas sac abscesses are much more frequent than is believed, especially in women, but that such inflammatory collections are not recognized as being of appendiceal origin. Santy[6] comments on the frequency with which spontaneous rupture of these abscesses in the rectum is followed by a rapid and permanent cure. He also reports a case of pelvic abscess in which rupture took place into the general peritoneal cavity.

Types of Appendiceal Pelvic Abscess. Bérard and Patel divide appendiceal pelvic abscesses into two types: (a) peri-appendiceal in which there is a direct connection with the abscess surrounding the appendix itself, and (b) the para-appendiceal in which the original abscess is above the pelvic brim, having no direct connection with the pelvic abscess beneath, which has formed by the gravitation of pus. There are intermediate types.

Appendiceal pelvic abscesses are classified by many clinicians into the two following types: the superior or iliac and the inferior or true pelvic. (Both types may coexist in the same patient.) The superior originates near the superior strait and, in its early stages, at least, is not recognized by either abdominal or rectal palpation. The inferior pelvic abscess is palpable through the rectum and usually bulges the rectal wall. There may be two or more appendiceal abscesses either distinctly separate or communicating with one another. An iliac abscess may gravitate into the true pelvis and from there ascend to the opposite iliac fossa. For an iliac abscess, perform an iliac laparotomy; for a true pelvic abscess incise the overlying rectal wall.

Symptoms of Apendiceal Pelvic Abscess. Although a pelvic abscess may be a direct consequence of a diseased or ruptured appendix and its main expression, yet the symptoms may not be those of a typical appendicitis. The clinician may be misled by the anomalous symptoms. The area of maximal pain is not situated at McBurney's point and the pain is diffused over the pubic region. Ballooning over the pelvic region, vesical pain and disturbances of urination are frequent. Royster says that the pelvic appendix (which type is most often associated with pelvic abscess) is characterized by absence of severe early pain, and that not until the appendix has perforated (generally at its dital end) are urgent symptoms noted. Royster explains the absence of pain by the fact that tension is not present because this type of appendix can empty itself and the first serious pain results from perforation. In the series of cases reported by Schmidt the symptoms suggested urinary tract involvement i. e., difficulty of urination, vesical tenesmus, and a rounded suprapubic mass which could easily be felt through the rectum and appeared to be connected with the bladder. These symptoms, of course, were due to pressure from the abscess mass.

Diagnosis. While neither abdominal nor rectal palpation will disclose the presence of a superior pelvic abscess, any doubtful acute process in the lower abdomen, especially in males, should arouse suspicion and calls for repeated careful rectal examinations. The diagnosis of a pelvic abscess which points toward the rectum can easily be made by rectal palpation; in fact, in these cases the rectum forms part of the appendiceal abscess wall. The examining finger feels in the anterior rectal wall, in the male immediately above the prostate, a soft, bulging, fluctuating mass.

In the male, an appendiceal abscess must be differentiated from a prostatic or periprostatic abscess, seminal vesiculitis, bladder diverticulum, etc. Abscesses arising from such causes may point toward and often rupture into the rectum. MacLaren,[10] however, suggests that practically

all pelvic abscesses in males are of appendiceal origin.

In women a pelvic appendiceal abscess, occurring between the bladder and uterus or in the Douglas cul-de-sac, might easily be ascribed to some other condition and the appendiceal origin may be overlooked. A typical case of this kind is reported by Condamin.[8] The patient, a young woman, had had her appendix removed. During the following five years she suffered from symptoms referable to an inflamed Douglas sac with a consequent uterine anteflexion, dysmenorrhea and general abdominal disturbance. The symptoms and disabilities disappeared on suppression of the douglasitis. Condamin says that apparently in this case at the appendectomy a certain amount of seropurulent discharge had penetrated to the Douglas cul-de-sac. Convalescence at the time of operation had been long and difficult. As Condamin justly observes, this case might have been erroneously diagnosed as a dysmenorrhea with an essential uterine anteflexion, congenital or acquired, but in reality all the symptoms were due to a douglassitis of appendiceal origin. In all cases of appendicitis, especially when the appendix hangs over the brim of the pelvis, rectal examination will prove serviceable. It will enable the clinician to detect pus-collections wholly pelvic and also those that are merely prolongations from the iliac abscesses not discoverable by abdominal palpation.

Insufficiency of the Ordinary Appendectomy in Cases with Pelvic Abscess. In operating upon a patient with an appendicitis having an anomalous course, surgical intervention need not necessarily be limited to the right iliac fossa, or to the parts adjacent or superior to the cecal region. The poor end-results obtained are often due to too limited an incision or to absence of adequate surgical drainage. The continuance of digestive disturbances, nausea, diminution of appetite, etc., calls for exclusion of an inflammatory process located in the true pelvis.

An acute pelvic abscess may follow immediately after an appendectomy as in my own and in Schrager's cases; it may be a late sequela to a ruptured appendiceal abscess, operated on or not, or it may occur with a so-called chronic appendicitis. The insidious symptoms arising from the abscess mask its appendiceal origin and a correct diagnosis is not likely to be made. Of course, where, as in my own case, an abscess points in the rectum and there is a history of appendicitis, the exact nature of the condition is easily recognized. Cases of appendicitis convalescing badly occasionally do so because the abscess is not drained at its most dependent point.

Methods of Surgically Dealing with Appendiceal Pelvic Abscess. Appendiceal abscesses, abdominal, pelvic or abdomino-pelvic:

a. May, if of small volume, undergo resorption.

b. May not increase in size.

c. May increase in size and invade adjacent areas, an empty hernial sac, space of Retzius, etc.

d. May rupture spontaneously, into a hollow viscus, into a gut segment, into the vagina, into the free peritoneal cavity or externally through the abdominal walls. (Rupture into the vagina is rare; into the rectum, less infrequent). Not uncommonly, spontaneous rupture into the rectum has been followed by early and complete cure.

Various methods of treating pelvic abscesses (apart from the iliac drainage of high pelvic abscesses) have been proposed. Jaboulay[11] in 1896 drained a primary appendiceal pelvic abscess through the rectum. Mauclaire,[12] Schmidt[7] and others prefer drainage through the perineal route. Besides Jaboulay, Ochsner,[13] Rotter, Peterson[16] and Chaput have used and praised rectal drainage of low pelvic appendiceal abscess. Delanglade[17] employed a pre-rectal incision circumscribing the anterior outline of the anus at the distance of a finger-width. Sutton operated in a similar way in one case with success. It is admitted that the pre-rectal incision is of service in periprostatic suppurations, but it is far inferior to the rectal route for evacuation of appendiceal pelvic abscess.

L. E. Schmidt, in discussing the perineal route and comparing two cases operated on this way with two other cases operated on from above in the usual way, remarks that the latter had a very long and stormy convalescence while the former ran a smooth course. Schmidt says that the perineal method was so superior that there is no comparison to be made. In cases where an appendectomy has not been already done, an abdominal operation may be performed at the same sitting.

In Peterson's case[16] operated on by rectal drainage, a gallon of foul pus was drained and the patient walked home well on the sixth post-operative day. Rivière[19] also reports a case of primary appendiceal pelvic abscess, operated on according to the Jaboulay technic, in which no subsequent drainage was employed following the original rectal incision and no doubt in some cases[23] this is sufficient.

Pauchet[20] and others use the abdomino-rectal method of draining low-situated pelvic abscesses, i. e., they supplement the abdominal incision for removal of the appendix by a rectal incision, performed at the same sitting for drainage of the pelvic abscess. Pauchet[20] believes that in purely pelvic abscesses the abdominal incision alone is insufficient for peritoncal drainage and that it exposes the patient to peritoneal infection; such a view seems fully warranted in the cases of low-lying abscesses. Pauchet successfully operated on 10 cases by this method and Bérard also reported a case successfully dealt with in this way.

In their review, Bérard and Patel[3] say that the draining of pelvic abscesses of appendiceal origin is best effected by the rectal route. It is far preferable to the abdominal,[15] perineal or parasacral routes. The parasacral method does not give an easy access to the pus-collection; it necessitates division of the fibres of the gluteus maximus and sacro-sciatic ligament. It may be attended with troublesome hemorrhage and leaves a wound difficult to keep aseptic (miction, defecation), and slow to heal.

The vaginal route is not a route of election. In female children, in young unmarried, and in nulliparous women, it should not be employed because the vagina does not admit of enough dilatation to permit a safe and adequate incision of the pus pocket. The prolonged contact of the cervix uteri with the infectious discharges escaping through the vaginal incision exposes the uterus and the adnexae to infection.

Objections to the Rectal Drainage of Pelvic Abscesses. Theoretically, the rectal routes is uninviting. Nevertheless, the objections that have been made to the rectal drainage of pelvic abscesses have been in the main theoretical. It has been said that it is a blind procedure, that it exposes to fistula formation and to contamination of the abscess cavity. Deaver regards rectal drainage of appendiceal pelvic abscesses as opposed to the principles of sound surgery, and as more risky than operation through the abdominal wall. There is moreover the disadvantage that the appendix cannot be removed. Deaver treats cases of pelvic suppuration due to appendicitis by the abdominal route. L. E. Schmidt says: "It has been shown to be dangerous to permit spontaneous rupture of abscesses, even if imminent signs of their rupture into the rectum are present, and considered surgically, it is not exactly the procedure of choice to open abscesses through the rectum."

It has also been objected that the rectal route is a blind one which exposes to intestinal injury, to rectitis on account of pus, and to fistula.

Rectitis has never been observed in any of the reported cases and fistula is common to all other methods of drainage by the lower routes; the fear of fecal reflux to the abscess cavity is to a great extent imaginary.

The method should only be employed when there are very definite indications and the finger guiding the scissors in the section of the rectal tissues can easily prevent injury to a coil of intestine.

Bérard and Patel say that the objections which have been made to the rectal route are not based on any serious findings and the 44 cases which these authors collected in which rectal drainage was employed prove its incontestable superiority over other methods. The surgeons who have used this method when definitely indicated, as in my own case, have been enthusiastic and the patients have in almost all cases made rapid recoveries. It is another instance where clinical experience is opposed to theoretical considerations.

The comparative mortality of pelvic abscesses drained by the abdominal and lower routes as given by Rotter[4] has already been cited and it is preponderatingly in favor of the latter. In the 44 cases of rectal drainage collected by Bérard and Patel, there was no mortality and there were no post-operative complications. Such results cannot easily be brushed aside.

In operating for an appendiceal abscess, the appendix should be removed if it can be found without prolonged searching, if it be easily accessible, and if its removal can be effected with-

out destroying protective adhesions and without inflicting serious trauma to surrounding loops of gut. In many cases, the operator, fearful of tearing fragile adhesions, or injuring inflamed intestines, limits his intervention to opening of the abscess. The only shortcoming of the rectal route is that it does not permit the removal of the appendix. This, however, can be done at a subsequent sitting through the aid of an appropriate incision. In a large number of cases, the spontaneous or operative, rectal or vaginal, drainage of a pelvic appendiceal abscess without simultaneous removal of the appendix had to be supplemented at a later day by an appendectomy, because the suppuration, though it had originated in the appendix, had not completely destroyed it. The rectal route for the opening of pelvic abscesses possesses the following incontestable merits:

1. Simplicity of technique.

2. Absolute safety. Negligible operative wound; hemorrhage, unimportant; mortality, nil. The hemorrhage, operative and post-operative attending it, is minimal as the incision only interests secondary branches of the inferior hemorrhoidal artery. It can always be controlled, either by light packing of the rectum or by seizing the lips of the rectal incision with forceps and ligating the bleeding points. The rectal route does not expose the general peritoneal cavity to additional contamination.

3. Absence of undesirable post-operative sequelae. It does not weaken the abdominal wall. There is no danger of fecal fistula, of incisional hernia. It does not, unlike the perineal and para-sacral routes, expose zones of loose cellular tissue to infection.

4. Rapidity of execution—short duration of required anesthesia.

5. It secures adequate dependent drainage and early recovery. Healing is favored by contractility of the rectal wall. In these low pelvic abscesses, amyloid liver and chronic sepsis often result if the dependent portions of the peritoneum are not drained.

6. It is efficient. The rectal route is adapted to the complete evacuation and thorough drainage of low pelvic abscesses. The orifice of exit which it creates is dependent, hence it secures thorough drainage. Invalidism and, at times, death result from inadequate drainage.

Technic of Rectal Drainage of Appendiceal Pelvic Abscess. The rectum having been irrigated, the patient is placed in the exaggerated lithotomy position; the buttocks are brought down over the edge of the table and elevated on a support. See that the urinary bladder is empty; if necessary, catheterize. The sphincter is dilated until it is completely paralyzed; two long-bladed flat retractors are introduced into the anal canal and the rectal wall is exposed. The fluctuating bulging-abscess mass soon appears covered with smooth, shining,rectal mucosa; a small incision is made in the anterior rectal wall and a closed sharp pointed forceps or a scissors is introduced into the abscess cavity. During withdrawal, the blades of the forceps or scissors are fully separated. A small rubber tube or gauze is introduced into the abscess cavity. I prefer gauze to rubber-tubing; it is non-traumatizing. These drainage agents are left in place for a day or two and are usually spontaneously expelled. Lavage of the abscess cavity is needless. It is of no value to constipate the patient.

Santy believes that the too rapid evacuation by the rectal route of a large pelvic abscess can, by the sudden collapse of the abscess wall, cause the tearing of protective adhesions and result in infection of the peritoneal cavity. We have been unable to find the report of an accident of this nature in the literature.

REFERENCES

1. Schrager, V. L.: Rectal drainage of Appendiceal Pelvic Abscess. Surg. Gynec. and Obstet, 1916, xxii, 482.

2. Royster, H. A.: "Appendicitis," New York, 1927, page 129.

3. Bérard and Patel: Traitement des abcès pelviens d'origine appendiculaire. Rev. de gynec et de chir. abdom. 1903, vii, 869.

4. Rotter: Zur Pathologie und Therapie der Douglas abscesse bei Perityphilitis. Deut. med. Wchnschr. 1900, xxvi, 628.

5. Archibald, E. L.: Report upon 89 cases of appendicitis. Montreal med. Jour. 1900, xxix, 81.

6. Santy, M. P.: De la prétendue bénignité des appendicitis pelviennes. Lyon Medical, 1926, xxiii, 646.

7. Schmidt, L. E.: A series of unusual cases with pathological conditions outside of the bladder, probably appendical abscess causing marked vesical symptoms. Surg. Gynec. and Obstet. 1911, xiii, 281.

8. Condamin, R.: Séquelles de l'appendicectomie et Douglassite. Lyon med., 1926, cxxxviii, 643.

9. Broca; Les abcès pelviens de l'appendicite. Bull. med. Paris, 1901, xv. 589.

10. MacLaren: Pelvic abscess with special reference to rectal drainage. Ann. Surg. 1908, xlvii, 1034.

11. Jaboulay: Drainage des collections peritoneales par le voie rectale. Lyon. med. 1898, lxxxviii, 143.

12. Mauclaire: Appendicitis perforante. Collection peri-

toneales iliaque et pelvienne. Bull. Soc. anatomque, Paris, 1897, vol. 72, p. 110.
13. Ochsner-Sprengel-Morrison: Cited by Schrager.
14. Chaput: Pulletins et memoires de la Societe de Chirurgis de Paris. Traitment des abces appendiculaires a prolongment pelvien. 1904, xxx, p. 648.
15. Pasteau, Octave: Appendicitis palvienne, Bulletin de lá Société Académigue de Paris. 1897, Sième, série, Vol. ii, p. 348.
16. Peterson, R.: Enormous Appendiceal Abscess incised through the rectum. Amer. Gynec. and Obstet. 1900, xvi, 240.
17. Delanglande: De l'incision prérectale des abcès pelvienne appendiculaires. Bull. et Mem. Soc. de Chir. Par. 1900, xxvi, 600.
18. Sutton: Perineal operation for perforative appendicitis with abscess in cul-de-sac. Jour. Assn. 1898, xxx, 1438.
19. Rivière: Un cas d'abcès pelvien d'origine appendiculaire traitée par la laparotomie rectale. Gaz. des hop. (Lancette franc) Par. 1904, lxxvii, 177.
20. Pauchet: Drainage abdomino rectal des abcès pelviens d'origine appendiculaire. Assoc. franç. de chir. 1904, xvii, 553.
21. Bérard: Abcès d'origine appendiculaire, abdomino-pelvien; drainage abdomino-rectal guérison. Lyon med. 1903, ci, 47.
22. Deaver, J. B.: "Appéndicitis"—Its diagnosis and Treatment. 3 Edit. p. 393.
23. Patel: Abcès appendiculaire pelvien ouvert par le rectum. Lyon médical, 1906, vol. i p. 428.

VALUE OF WHITE AND DIFFERENTIAL COUNT IN ABDOMINAL SURGERY*

A Plea for Routine Use of Differential Counts

H. P. Miller, B.Sc., M.D., D.N.B., F.A.C.S.
St. Anthony's Hospital
ROCK ISLAND, ILL.

The leucocyte count as a cardinal sign in acute surgical conditions has been a valuable aid in diagnosis and treatment for a matter of two decades. The early papers of men such as Wilson,[1] Sondern,[2] Gibson,[3] focused attention at that time on this valuable adjunct. In recent years Meninger and Heim,[4] using cases from the surgical service of Gibson, have confirmed and re-emphasized the earlier papers of Gibson. Neal and Robnett[5] have still more recently (Sept., 1927) reported a large series of cases checked by pathological diagnosis re-stressing the whole work. Like all advances in medicine, attention is at first attracted, lack of proper perspective leads to overenthusiasm with false deductions, then swinging of the pendulum in the opposite direction. Such a valuable aid as the study of the white cells with their inter-relationships has been no exception. The total white count alone has fallen into considerable disrepute as a reliable aid. Also, the general impression prevails that the differential count is an elaboration of the total leucocyte count, rather than as this paper will tend to show an entirely different, more valuable element. It is true leucocytosis is too variable a quantity to rely on alone. The percentage of polymorphonuclears is a valuable surgical aid. The proportionate relationship between the two as first definitely stated by Sondern in 1905 is the central point. This factor depends not on any given quantities nor on absolute percentage of polymorphonuclears but rather on the relative percentage of polymorphonuclears to the total white count. The total white count varies with the resistance of the patient. There is no method by which to evaluate this factor except as brought out in this paper and here lies the key to the disappointment of the surgeon in relying on total white counts in surgery. It is said of a great surgeon now dead that in acute appendicitis a white count was always made and never looked at until after operation. I will try to show that such an attitude is unjustified in the light of our present knowledge and places surgical judgment under a handicap at least two decades behind the times.

Let us consider for a moment the usual blood picture in a normal individual. W. B. C.'s normally run from 7,000 to 10,000. Counts below this are not uncommon, but above this in the usual clinical experience is suspicious of some infective process. More important than the total count is the enumeration of the percentage of the various types of cells which make up the white cells of the blood. We will not repeat what can be seen in any standard text-book further than to state that normally the white cells are made up as follows:

Polymorphonuclear	60-70%
Eosinophils	1-4%
Basophils	0.25-0.5%
Lymphocytes (large and small)	25-33%
Large mononuclear and Transitional	2-6%

Recognition of the various types is easy. A few cells which cannot be placed may be put down as unclassified.

Various theories are held by laboratory men as to the origin of these various types, but that is neither here nor there to us as clinicians and surgeons, in their application to diagnosis, prognosis and treatment. A clinical application of the theories of origin in judging somewhat as to the severity of the infection has been made by some foreign workers, especially in Germany,[5] by noting the number of immature cells—those with

*Read before Rock Island County Society, April 10, 1928.

fewer lobulations. A few pertinent facts in regard to their reactive powers in disease is germane, however, at this point to a full understanding of what will be said further on.

Infective processes of a so-called pyogenic nature are characterized by a local increase of polymorphonuclear cells at the site of infection. If there is a marked degree of accumulation it is visible to the naked eye as pus. On the other hand, marked variation in density can occur from gross pus to a simple microscopic exudation of polymorphonuclear cells seen only in the microscopic slide; such is found in an early acute purulent appendicitis. Accompanying or preceding this local reaction is an increase relative or absolute of the same type of cell in the circulating fluid. The factors causing this increase in the blood and attraction of cells to the local process is intimately bound up with chemotaxis, phagocytosis, immunity, questions not taken up in an article of this scope.

Investigation of the white cells in various conditions has shown a specificity in the type of white cell reaction depending on the local cellular pathology.[4] A typical example is shown in typhoid fever. The local pathology in the Peyer's patches is a marked proliferation of the reticular endothelial cells of the lymphoid tissues which becomes so marked later as to lead to choking off of nutrition with necrosis. In the blood, although a leucopenia or low total count is usually present, marked increase in the large mononuclears or as they are sometimes called endothelial leucocytes is present. A similar picture is found in malaria. In asthma or intestinal infestation locally in the organ involved there is an infiltration of eosinophils with corresponding increase in the eosinophils in the blood.

The mention of eosinophils leads us to express another fact. The so-called "septic factor" is found in acute pyogenic conditions. In conditions attended with local infiltration of polymorphonuclears there is a polynucleosis depending on the severity of the infection in the blood as has been mentioned before. Along with this there is a drop or absence in the eosinophils—an aneosinophilia. So in an advancing infection the polymorphonuclears go up and eosinophils drop. I personally have not paid much attention to this. In order to properly enumerate the eosinophils 300 to 400 cells must be counted. For extremely accurate work this is desirable, but for usual clinical work ample indication is obtained from a count of 100 cells at least within limit of error as exact as many other clinical procedures and main attention is on the polynuclear count. We know the eosinophils drop as the polymorphonuclears go up and can bear that fact in mind for verification if necessary.

Countless times in reading over surgical literature one is given a beautiful clinical presentation with history, physical findings, operative report, pathological examination and progress notes without adequate blood study. Perusing a recent article reporting a case of acute intestinal obstruction the total white count was given as 33,000. The clinical picture suggested a grave prognosis. No initial differential count was made and in complete progress notes no daily white count or differential was made, although operation was delayed several days because of various factors. Correct treatment was administered finally in this case. The surgeon of experience relies on his clinical judgment in view of all the evidence and eventually arrives at a true decision. Yet we are habitually not making use of a laboratory aid of inestimable value. I myself was formerly guilty of this error. You can all recall cases of appendiceal abscess with a normal total white count. But what would the differential count have shown? Would it check with the condition found at operation? A justifiable lack of confidence in the total count and dependence on clinical judgment led to operation immediately. Surgeons have come to look askance on a total count singly or in series because of cases such as these. Certain facts, however, are now well known and should be made use of. Todd[7] in the latest edition makes clear the importance of the white and differential count and presents the Gibson chart as a means of graphic portrayal of the white cell reaction. This will ground the student and those who have access to new text-books, but to the general run of practitioners current articles in the general medical journals are the chief mode of gaining notice. Sondern in 1905 was the first to boldly state that the total white count was proportional to the resistance and the polymorphonuclear count to the severity of infection.

Todd states definitely and clearly the total white count in acute surgical conditions is proportional to the severity of the patient's resistance while the polynuclear count is proportional

to the gravity of the condition. Mild septic conditions show a polynuclear count of 75 or 80. A count over 85 indicates pus somewhere in the system and higher counts, over 90, indicates grave conditions such as a diffuse peritonitis.

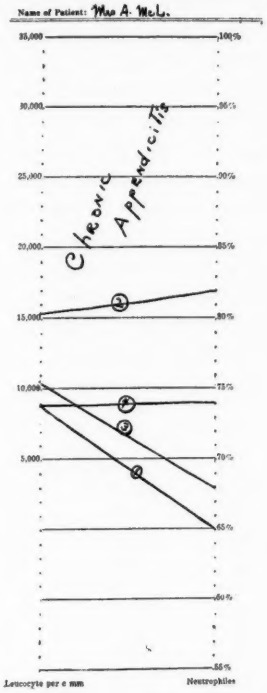

Fig. 1. Case—Mrs. A. McL. Gibson Chart as Modified by Neal and Robnet.

No method so clearly or dramatically brings out at a glance proportionate or disproportionate increase or decrease in either factor than a pictorial representation. Points missed completely or in the background thus become emphasized. Such a relationship may be shown graphically in a number of ways. Gibson's method is perhaps the simplest. Taking the highest total normal count as 10,000 and the highest proportionate polynuclear count as 75, a line is drawn connecting the two on a special sheet. Above and below this base line are horizontal lines one centimeter apart. The total white count is inserted on the left and polynuclear percentage on the right. On the left each centimeter marking indicates 1,000 in the total white count and on the right 1% in the polynuclear count. If the two are in proportion the line is horizontal. If the patient's resistance in an acute, or, as very often happens, in a chronic condition, is greater than the severity of the infection the line is descending. If the infection is increasing out of proportion to the resistance of the patient the line is ascending. Ordinarily a raise of one in the polymorphonuclear count above normal should be accompanied by a raise of 1,000 in the total count. Thus a differential count of 75 would, if the patient's resistance is good, be accompanied by a total count of 15,000. A raise in polymorphonuclear out of proportion say 78 and a total count of 11,000 would give a marked ascending line and be indicative of severe infection with poor reactive qualities. In the cases with a normal total count in presence of pus if a differential has been done a high polymorphonuclear percentage would invariably be present with a marked ascending line. This has been checked over and over again with pathological examinations of the tissues and found correct. Neal and Robnett[8] report a series of 227 cases checking the proportionate leucocyte count with the histological examination and in no uncomplicated case was its prognostic import faulty. Gibson[9] reports similar findings in a series of 705 cases. An important deduction brought out in the graphic study of the blood in these 705 cases are two facts already learned by clinical experience, i. e., the resistance line becomes more and more ascending with advancing age; from its lowest before 20 it rises gradually till it is sharply ascending at 80. Also, in the mildly inflamed appendix it is gradually rising, becoming steeper through the various grades of purulent, thrombosis, gangrene and highest when diffuse peritonitis has set in. In the face of such evidence even the most skeptical observer must be convinced.

Frequent counts should be done where the necessity for operation is in doubt. In the face of an acute abdominal condition with a rising line becoming more acute when checked at 2 or 4 hourly intervals interference is imperative. Routinely such cannot be done in the ordinary private hospital or private practice because the expense is prohibitive. My own practice in average definitive surgery of the abdomen is a complete count done the day before operation, then the first, third and fifth day postoperative. Witter,[10] in a detailed study of the leucocyte count preoperatively and for seven days postoperatively

in a series of 39 clean cases, found the findings return approximately to normal the 5th day.

TABLE 1

(M. S. Witter)

	Total White Count				Percentage Polynuclears				
Day of Count	No. of Cases	Minimum	Maximum	Average	Day of Count	No. of Cases	Minimum	Maximum	Average
Preop..	30	6,000	13,000	9,000	Preop..	30	42	80	66
1.....	21	12,000	26,000	18,000	1.....	20	73	94	82
2.....	24	10,000	27,000	16,000	2.....	26	75	93	82
3.....	28	9,000	21,000	13,000	3.....	28	73	93	79
4.....	25	6,000	21,000	11,000	4.....	24	64	87	76
5.....	23	7,000	19,000	10,000	5.....	24	58	74	70
6.....	23	8,000	19,000	12,000	6.....	17	70	84	75
7.....	18	7,000	24,000	13,000	7.....	21	62	83	75

There is then a slight rise in total count and polynuclear due probably to absorption of suture material. The maximum rise occurs on the first day and within four hours of the operation, as shown by her studies. Meleney[11] gets practically the same results in a series of cases. To accord the leucocyte count and differential proper interpretation one must have an idea of the normal values. One soon learns to recognize the typical reaction and an abnormal graphic chart immediately puts one on the alert for complications and leads to further and more frequent checking of the count. A table giving reactions normally occurring in some uncomplicated routine abdominal operations in my own experience is given below.

The slant of the resistance line on the graphic chart may be expressed in plus or minus units of disproportion. In the original Gibson Standard Chart the divisions were one centimeter apart. If the line slants upward the number of spaces it is above horizontal are given the positive figure such as plus 1, plus 2, et cetera. If the line slants downward the number of units below horizontal is expressed in the negative figure. Horizontal or negative units indicate a good or adequate resistance. Plus units indicate the line slants upwards and resistance is not keeping pace with infection. A gradual progress from positive to negative in successive counts in an acute condition indicate subsiding infection or increased resistance or adequate dealing with the cause. In the preceding table of typical cases the resistance line is expressed in units of disproportion and it will be seen these statements are borne out. With a standard chart and individual study of his cases the surgeon has a picture in his mind of the graphic record of the count and as a rule this is easier to comprehend and compare than to think in units of proportion.

Although a special chart is desirable, such as

TABLE 2

	PREOPERATIVE				POSTOPERATIVE			
Diagnosis	Time	Total Count	Polys.	Unit	Time	Total Count	Polys.	Unit
Acute Appendix Case H. M.	1	13,000	76	—2	1st day	14,000	80	+1
					3rd day	12,000	76	—1
					5th day	8,000	68	—5
Chronic Appendix Case A. McL.	1	8,150	65	—8	1st day	15,500	82	+1
					3rd day	10,050	68	—7
					4th day	9,000	74	0
Chronic Choletheasis Case M. B.	1	11,250	68	—8	1st day	29,300	80	—14
					3rd day	23,050	90	+2
					4th day	12,100	81	+4
Hemorrhage (Ruptured liver) Case S	1	31,000	82	—14	1st day	27,200	76	—16
					3rd day	11,800	75	+2
Dilatation and curetage Incomplete abortion Case W. H. H.	1	20,150	76	—9	1st day	9,300	60	—14
					3rd day	8,750	62	—12
Dilatation and Curetage (Menorrhagia) Case A. P.	1	8,000	65	—8	1st day	11,450	72	—5
					3rd day	12,000	73	—5
					5th day	10,000	68	—7
Malignant endocarditis and septic meningitis Case L. N.	1	15,250	85	+5	1st day	15,000	91	+11
					2nd day	27,950	79	—1
					5th day	28,700	94	death
Acute Intestinal Obstruction Chas. W.	I. 9 a. m.	10,800	89%	+13	2nd day	10,200	85	+10
	II. 12 m.	12,900	92%	+14	3rd day	9,020	73	—1
Acute appendix and Rl. oophorectomy M. D.	1	14,400	59	—20	1st day	13,800	75	—4
					5th day	9,000	71	—3
Septic meningitis and malignant endocarditis L. H. Laparotomy	1	15,250	85	+5	1st day	15,000	91	+11
					2nd day	27,950	79	—13
					5th day	28,700	94	Death

used by Neal and Robnet, it is not absolutely necessary. The ordinary temperature chart has been used by me and has the advantage of keeping all the data together so that in observing the temperature reaction the surgeon has the blood examination in mind at the same time. One merely needs to adopt some standard base line and have the laboratory technician draw the graphic line when she enters the blood count on the laboratory sheet.

After using this data for a time no surgeon count taken together are an extremely valuable prognostic and diagnostic aid in surgery.

2. A graphic method with pre-operative and repeated post-operative count should be routine.

3. Complications are indicated before clinical signs are evident and lead to earlier, more effective, treatment.

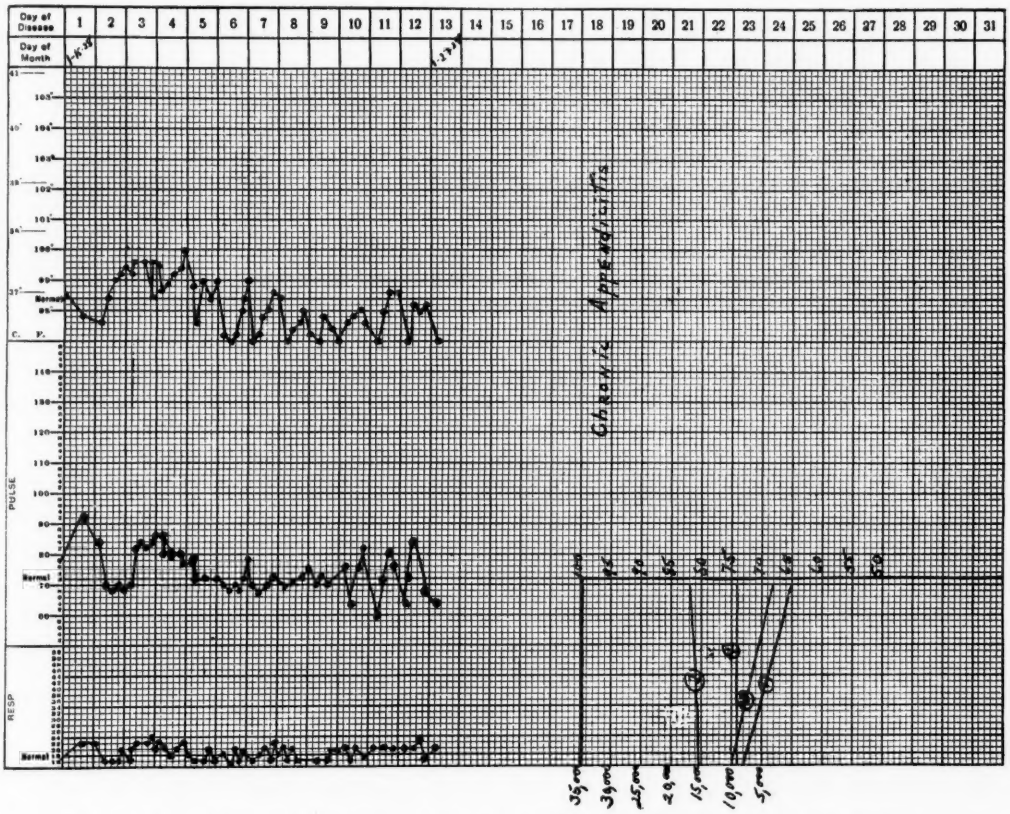

Fig. 2. Case—Mrs. A. McL. Improvised Graphic Chart on Ordinary Hospital Record.

but can be convinced of its value. The study of the white cells was used more 20 years ago than it is today, chiefly through false impressions, misunderstanding and lack of knowledge. The statement of one or two great leaders becomes handed down and none takes the trouble to investigate the fallacy.

CONCLUSIONS

1. The total white count and differential

BIBLIOGRAPHY

1. Wilson, R. N.: The Practical and Scientific of the Blood Examination to the Medical Man and Surgeon. Am. Medicine, i, 404-448, Sept. 4, 1901.

2. Sondern, F. E.: Present attitude towards Blood Examination in Surgical Diagnosis. Med. Record, XI, 452-455, Nov. 25, 1905.

3. Gibson, C. L.: Value of the Differential Leucocyte Count in Acute Surgical Disease. Annals of Surg., xliii, p. 485, April, 1906.

4. Meninger, W. C. and Heim, H. S.: The Clinical Significance of the Relation of Total and Differential Leucocyte Counts in Acute Appendicitis. Annals of Surg., LXXX, 926, Dec., 1924.

5. Sorken, A.: The Role and Importance of the Leukocyte Formula in Surgical Disease. Zentralbl. f. Chir., Feb. 6, 1926, LIII, 336-338.

6. Neal and Robnett: Proper Use and Interpretation of

the Leukocyte Count. Southern Med. Jour., Sept. 1927, XX, 700-710.

7. Todd, J. C. and Sanford, A. H.: Clinical Diagnosis by Laboratory Methods. Sixth edition. W. B. Saunders Co., 1927.

8. Neal, M. P., and Robnett, D. A.: The Leucocyte Count as a Diagnositc Aid in Appendicitis. Med. Herald and Physiotherapist, Nov., 1927.

9. Gibson, C. L.: Significance of Leucocytosis in Acute Inflammation. Trans. Internat. Surg. Congress, 1920, p. 750.

10. M. S. Witter: Postoperative Leucocytosis. Surg., Gun. & Obs., xl, 23-30. Jan., 1925.

11. Meleney, F. L.: A Study of Ante-operative and Post-operative Blood Counts in Non-infective Surgical Conditions. Ann. Surg., lxvii, 129, 1918.

CERTIFIED MILK*

M. GERTRUDE SLAUGHTER, M. D.

CHICAGO

The Milk Commission of the Chicago Medical Society has asked me once more to speak before your branch of this organization and point out the value and importance of certified milk.

Since we know that milk is the only food that contains all the elements necessary to life, namely, protein—each molecule of which contains at least eighteen amino acids,—carbohydrates, fats, mineral sales—especially calcium, and the very essential vitamines, our next concern must be to obtain it free from foreign material, namely dirt and pathogenic bacteria.

Pasteurization has made milk nearly one hundred per cent. safe from pathogenic bacteria, and has undoubtedly saved thousands of lives and untold suffering. But unfortunately pasteurization and boiling destroy the vitamines, precipitate the lime salts and also change the chemical composition of the protein molecule to a sufficient degree to greatly impair its nutritive value. This was proved by the great increase in rickets among children after the pasteurization of milk was first instituted, and it was learned that orange juice or tomato juice and cod liver oil had to be added to prevent rickets. Then, too, while pasteurization kills the pathogenic bacteria, it does not eliminate dirt in the milk. And I assure you that the amount of dirt in the average milk used for pasteurization is not inconsiderable.

When driving in the country, just look in at the average dairy farm. See the cows in dirty stalls with manure covered flanks, that are milked by people who do not even have to wash their hands, much less have physical examinations, and you will know just what I mean. Why it is only within a year that our milk has come from *tuberculin* tested cows in this district.

The difference between this kind of milk and certified milk is summed up in these requirements:

1. Cows that are in perfect health, tested, watched and examined daily to see that they are in perfect health.

2. Cows that are perfectly clean. Without the slightest chance of a particle of dirt getting into the milk, and the bacterial count kept down from 2000 to 3000. For although the requirement is 10,000 or less, the producers voluntarily keep it down to the lower figure.

Cows fed properly balanced rations the year around, to produce an even quality of milk.

4. Men caring for the cows and milk who have undergone a thorough physical examination, as well as periodic examinations with nose and throat cultures, and also a fecal test to eliminate typhoid carriers. No one exposed to a communicable disease is employed in the production of milk. These men must not only be perfectly healthy but perfectly clean.

The above measures certify a milk of the highest possible standard of purity, retaining all the health and body building qualities that nature intended milk to have, with nothing added and nothing taken away or spoiled by boiling, or pasteurization.

With no pathogenic bacteria present pasteurization is unnecessary.

Whole certified milk is the one perfect food for all ages.

*Read before Stock Yards Branch, Chicago Medical Society.

DUODENAL DIVERTICULA WITH ULCER*

MAX THOREK, M.D.,
Surgeon-in-Chief, The American Hospital

CHICAGO

Diverticula, either congenital or acquired, may occur in the duodenum as elsewhere in the intestinal tract. Morgani[1] is generally credited with being the first, in 1761, to describe a duodenal diverticulum which he believed to be of congenital origin. However, Chomel,[2] in

*Read before the Chicago Medical Society, March 7, 1928.

1710, reported to the Academy of Paris a case of duodenal diverticulum occurring in a woman 80 years of age, in which there were twenty-two calculi. It is not clear whether this was a true diverticulum or a pouching due to a fistula between the bile ducts and the duodenum.

Frequently such duodenal diverticula, especially the acquired type, are associated with ulcer in their immediate vicinity, and some authors consider acquired diverticula as a pseudo-type, resulting from the scarring of healed ulcers with consequent puckering or contracture of the bowel wall, a point to which I shall refer later.

A case upon which I recently operated is of interest not only because of the comparative rarity of duodenal diverticula, but more especially because, although ulcers have been found in the vicinity of such defects, or upon the opposite wall, in this instance the ulcer was situated in the diverticulum itself, and had perforated into the head of the pancreas. Very few similar cases are recorded in the literature, so far as I have been able to find. The following are the main items of interest in the case:

P. V. B., white, male, aged 35, married, a salesman by occupation was admitted to The American Hospital on November 23, 1927.

The family history was of no importance in connection with his ailment. A review of his past history revealed that he had had the usual diseases of childhood, and that a tonsillectomy had been performed two years previously. He had been troubled with his stomach for the past five years, experiencing nausea, epigastric distress, with occasional sharp pains and vomiting. Food always relieved the gastric distress. He did not recall ever having vomited blood. He had not been constipated and there had been no hemorrhages from the bowel.

For the past two months the patient had complained of continuous discomfort in the epigastric region. The pains had recently become more acute, but were relieved by taking food. He occasionally had eructations.

Physical examination showed a fairly well nourished male. With the exception of a soft, blowing systolic murmur at the apex nothing abnormal was

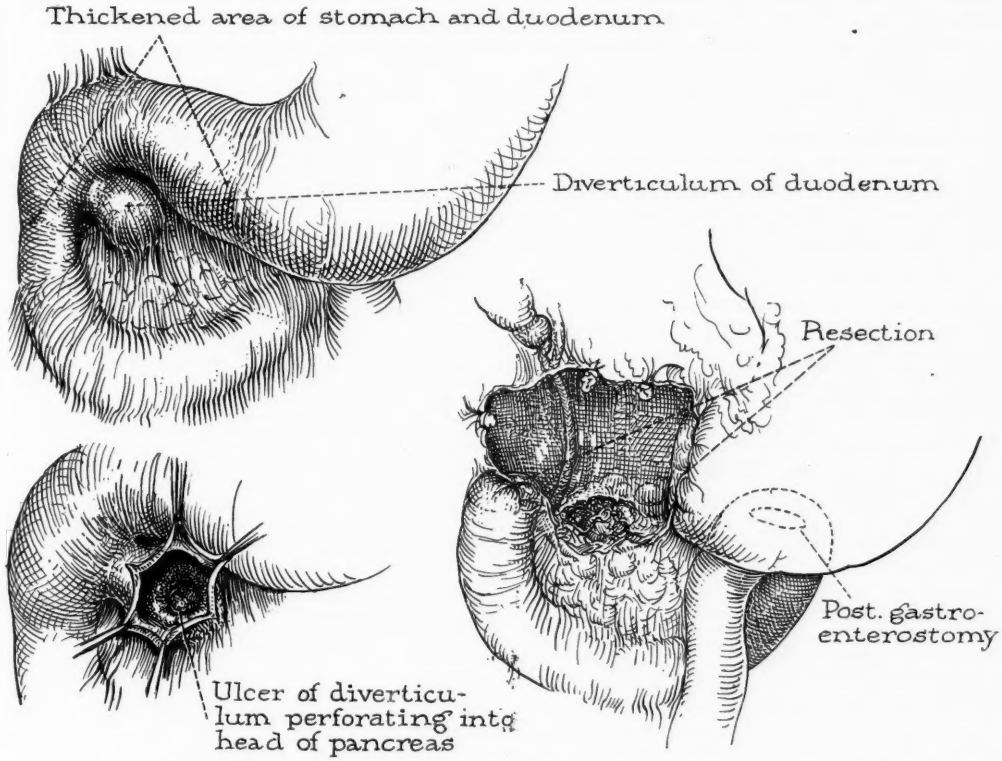
Thickened area of stomach and duodenum
Diverticulum of duodenum
Resection
Post. gastro-enterostomy
Ulcer of diverticulum perforating into head of pancreas

Fig. 1. Diverticulum of duodenum with ulcer perforating into head of pancreas: Technique of surgical management.

found in the chest. The head, neck and extremities were negative.

Examination of the abdomen revealed tenderness in the biliary region and in the epigastrium. The stomach outlines were apparently normal.

The glandular, neuromuscular and genitourinary systems showed nothing abnormal.

The temperature was 98.6° F., pulse 78, blood pressure 126 systolic, 78 diastolic; respirations 20.

Urinalysis, with the exception of an excessive amount of phosphates, was negative. The blood Wassermann reaction was negative. Blood examination showed 4,400,000 red cells, 8,800 leukocytes; hemoglobin 95 per cent. The differential count showed 20 small monocytes, 8 large 70 per cent. polymorphonuclear neutrophiles 2 per cent. eosinophiles. Gastric analysis showed a moderate degree of hyperchlorhydria.

Study of the roentgenologic findings disclosed the characteristic manifestations of duodenal ulcer. A rather large shadow, undiagnosed, puzzled the radiographer. Otherwise the gastrointestinal findings were negative.

Operation was advised, and performed on November 26, 1927. Under ethylene anesthesia the abdomen was opened through a pararectal incision. The biliary system was examined and found negative. Upon exploration of the stomach a general thickening of the pylorus was observed which extended well beyond the borders of the first part of the duodenum. Periduodenal adhesions were present which were severed and the pylorus and first part of the duodenum mobilized. This procedure disclosed a diverticulum in the first part of the duodenum, which was markedly thickened, friable, and extended into the head of the pancreas. If was dissected away with difficulty. After dissection it was found that an ulcer situated at the very base of the diverticulum and about the size of a thumb, had perforated into the head of the pancreas. We then proceeded to dissect the thickened pylorus and the first part of the duodenum, which bore this pathological area. After this had been accomplished the wound in the head of the pancreas was sutured. The duodenum was carefully closed and protected with a pad from the large omentum, which was sutured *in situ*. A posterior gastrojejunostomy completed the operation. Peritoneal toilet, cigarette drains and closure of the abdomen.

Postoperative course: The patient reacted well and progressed very satisfactorily until about two weeks after the operation, when a large amount of tarry blood was evacuated from the bowel. Another evacuation of similar type occurred on the following day. From that time on the patient went on to an uninterrupted recovery and returned to his work a few weeks later. At the present time he is enjoying perfect health. The pathologists report disclosed typical manifestations of ulcer within the duodenal pouch.

Perry and Shaw[3] (Case No. 11) described the case of a woman, aged 52, who died following a severe hematemesis. At the autopsy the duodenum was found to contain, immediately contiguous to the pylorus, a deeply recessed ulcer, which formed the floor of a pouch about three-fourths of an inch deep. In its base the eroded pancreas was exposed. There were also two other simple, shallow duodenal pouches.

The same authors in another autopsy (Case 234) found a pouch of the duodenum in its posterior wall, three-fourths of an inch from the pylorus. The posterior part of this pouch was fibrous and firmly adherent to the head of the pancreas.

Wilkie,[4] in 1913, stated that a variety of duodenal diverticula occurs with chronic duodenal ulcer, being found almost exclusively in the roof of the duodenum within one inch of the pylorus. In such cases the wall of the sac is formed of dense, fibrous adhesions, the duodenal wall having been completely destroyed by ulceration. Wilkie said that he had come across three well-marked examples of this variety of diverticulum. In one of them a secondary perforation of the wall of the diverticulum had occurred and led to peritonitis, in a patient only 21 years old.

It will be observed that all these cases occurred in the first part of the duodenum, near the pylorus.

A full discussion of the grounds in support of the congenital origin of some diverticula will be found in the articles by Wilkie[4] and Buschi.[5] Keith[6] believes that diverticula occur at naturally weak spots in the bowel wall. Wilkie mentions the occurrence of congenital duodenal diverticula in fetuses and infants, and Cimmonds[7] reports that he saw a diverticulum close to the pylorus in a very young child.

Perry and Shaw[3] distinguished two types of mechanical produced diverticulum. In one the sac is produced by the traction of external adhesions. In the other the starting point of the process is an ulcer, the base of which has yielded to the pressure of the intestinal contents. This variety is differentiated from the first by the scarred and ulcerated condition of the mucosal lining, or by inflammatory fibrous tissue.

To the congenital and ulcerative types Wilkie adds a third, which might be called a pulsion diverticulum, which is due to a ballooning out of the duodenal wall in the vicinity of, or opposite to the scar of an old healed ulcer. Carman[8] states that the most common site for duodenal ulcer is along the superior border *just below the pylorus*. As a result, after the ulcer

has healed, most of the shortening takes place at this point, leaving the lower border redundant and favorable to the formation of pouches or diverticula. In this type the walls of the diverticulum preserve all of the normal layers of the bowel wall.

Cases of duodenal diverticula associated with ulcers in the immediate vicinity of the pylorus have recently been reported by Rosenthal,[9] and diverticula opposite the scars of healed ulcers in the first part of the duodenum have been recorded by Ritchie and McWhorter,[10] Murchison,[11] Dickey,[12] Penhallow,[13] and others.

In one of Rosenthal's cases the diverticulum was situated caudal to the pylorus in the first part of the duodenum. There was also an infarcted, bleeding ulcer between the pocket and the pylorus, and another healed ulcer scar just beyond the pocket. The walls of the diverticulum were normal. I have already referred to Wilkie's cases of diverticula in the first portion of the duodenum, which were directly associated with ulcer.

Nagel[14] distinguishes between developmental diverticula not associated with ulcer and the acquired type which, as a rule, are definitely associated with ulcer or other pathologic conditions. The defect is not due to perforation on the base of an ulcer, but to muscle spasm and contraction of ulcer scar tissue, with pressure from within the bowel. In such cases the diverticulum is usually situated on the lower anterior border. With this view Moynihan[15] agrees.

Frequence of Duodenal Diverticula. Wilkie found sixty-eight cases of duodenal diverticula reported in the literature up to 1913, most of them being found in autopsy.

Ritchie and McWhorter found seventy-six verified cases in the literature.

Since the introduction of radiologic investigation of the intestinal tract, the discovery of diverticula of the duodenum has been much more frequent. Case,[16] in 1914, reported that in 6,847 roentgenologic examinations of the intestinal tract he had found eighty-five duodenal diverticula. Cole and Roberts[17] found thirty cases upon roentgenologic examination, and Forsell and Key,[18] in 1917, diagnosed a duodenal diverticulum by this method.

Nagel[14] states that duodenal diverticula were found in 2.2 per cent. of the autopsies at the Mayo Clinic during 1922 to 1924, and during the same period nineteen cases of acquired diverticula were verified by operation.

Site of Duodenal Diverticula. The great majority of duodenal diverticula occur in the second part of the duodenum, close to the ampulla of Vater. Of the eighty-five cases observed by Case, seventeen were in the first part, forty-nine in the second part and nineteen in the third and duodeno-jejunal portions of the duodenum. All of the twenty cases of developmental type found at autopsies in the Mayo Clinic were in the second part of the duodenum within 3 cm. of the ampulla of Vater, and only four of these were below the ampulla. The nineteen acquired diverticula discovered at the Mayo Clinic during operation were in the first part of the duodenum, and all were associated with ulcer. Only seven of the seventy-six cases collected by Ritchie and McWhorter[10] were in the first part of the duodenum. Buschi[5] considers that diverticula which occur in the first part of the duodenum are congenital, and this view is also held by Linsenmeyer,[19] who found that only 8 per cent. of diverticula occurred in the first part of the duodenum. This does not, however, exclude the occurrence of congenital diverticula in the second and third parts, although this is very rare.

Size. According to Carman[8] the diverticular pockets vary in size from 1 cm. in diameter and depth to 4 cm. in depth and 1.5 cm. in width. Nagel states that the size varies from a few millimeters in diameter and depth to pockets 6 cm. long with an average width of 1 cm. to 2 cm. Case observed diverticula as large as a hen's egg.

Sex and Age. Of the twenty developmental type of diverticula reported by Nagel, twelve were found in males, and of the nineteen cases of acquired type, ten occurred in males. Case, however, found that 62 per cent. of the cases occurred in males, with the average age of the patients fifty-six years. In the series reported by Nagel, the average age was forty-six years. One of Rosenthal's cases of associated diverticulum and ulcer occurred in a male patient aged twenty-one. The cases of purely congenital type have been found at all age periods, and in both sexes.

Pathology. As a general rule congenital and

developmental duodenal diverticula do not show any pathologic processes.

Diverticula which arise in the vicinity of, or opposite to, the scars of healed ulcers are usually simple pockets, the walls of which preserve all the layers of the bowel wall. Occasionally they may be the seat of inflammatory or catarrhal changes due to the retention of débris, as in the cases reported by Rosenthal and Bauer,[20] in the second part of the duodenum.

In the ulcerated type of diverticula, as a rule, all the layers of the bowel wall are preserved near the orifice of the sac, but elsewhere the muscularis is absent. In such cases, directly associated with ulcer, the wall of the sac is often formed of dense fibrous tissue, the normal structure having been entirely destroyed by ulceration. Wilkie observed three cases of this type.

In twenty-one of eighty-two cases of duodenal diverticula collected by Baldwin,[21] in 1911, the sac had pushed into the head of the pancreas, but in only a few instances was there any evidence of inflammation. In Akerlund's[22] case the sac held a mass of necrotic pancreatic tissue, and Case observed the same thing. Nagel stated that some of the diverticula observed in the Mayo Clinic had wormed their way between the head of the pancreas and the bowel wall; in every instance there was close association with the pancreas, many of the diverticula being completely buried in it. In my case the ulcer in the sac had perforated into the pancreas and the head was much eroded.

Ordinary duodenal ulcers, of course, quite commonly penetrate into the pancreas, and in cases where a duodenal diverticulum is associated with a contiguous ulcer this may have occurred and the inflammation spread to the diverticular wall. In one of Rosenthal's recently reported cases of associated duodenal ulcer and duodenal diverticulum an active ulcer had penetrated into the head of the pancreas, which had to be removed. The diverticulum was not pathologic in this case, which was quite different in this respect than mine.

Treatment of Duodenal Diverticula. No standardized surgical treatment can be indicated in a case of this type, and the surgeon must act on his own initiative according to the conditions found. In the simple type of diverticulum closure of the sac, with trimming, may suffice. In the ulcerative type a more or less extensive resection may be indicated, but in active ulceration with involvement of the pancreas Rosenthal found it necessary to remove the pyloric part of the stomach and part of the duodenum in this vicinity, as well as a portion of the head of the pancreas. He used the Billroth No. I type of closure.

In my case I performed a Billroth No. II operation, with removal of the pylorus and the pathologic first part of the duodenum, and the posterior gastrojejunostomy. Part of the head of the pancreas also had to be taken away, and the wound sutured. The operation in this case was particularly difficult because of the friable condition of the duodenal stump, which prevented the sutures from holding. Omental peritonization was necessary.

BIBLIOGRAPHY

1. Morgani: De sedibus et causis morborum. Epist. 34, Paris, 1761.

2. Chomel: Historie de l'Acad. Royale, Paris, 1710.

3. Perry, E. C., & Shaw, L. E.: Guy's Hospital Reports, London, 1892, pp. 171-305.

4. Wilkie, D. P.: Edinburg Med. Jour., 1913, n. s. XI, 219.

5. Buschi, G.: Virchow's Arch. f. path. Anat., 1911, ccvi, 121.

6. Keith, A.: Brit. Med. Jour., 1910, I, 376, and Brit. Jour. Surg., 1924, XI, 453.

7. Simmonds: Cited by Wilkie.

8. Carman, R. D.: Am. Jour. Roentgenology, 1916, III, 252.

9. Rosenthal, P.: Mitteil a. d. Grenzgeb. d. Med. u. Chir., 1927, XI, 131-145.

10. Ritchie, H. P., & McWhorter, G. L.: Surg. Gnec. & Obstet., 1917, XV, 485.

11. Murchison: Jour. A. M. A., 1920, LXXV, 1329.

12. Dickey, L. B.: Jour. A. M. A., 1926, LXXXVI, 815.

13. Penhallow, D. P.: Jour. A. M. A., 1923, LXXX, 1372.

14. Nagel, G. W.: Arch. Surg., 1925, XI, 529.

15. Moynihan, B.: Duodenal Ulcer, 1912, 268.

16. Case, Jas. T.: Jour A. M. A., 1920, LXXV, 1403. Also, Am. Jour. Roentengenology, 1916, III, 314.

17. Cole, L. G., & Roberts, D.: Surg. Gynec. & Obstet., 1920, XXXI, 376.

18. Forsell, G., and Key, E.: Fortsch. a. d. Geb. d. Roentgenstral., 1917, XXIV, No. 8.

19. Linsenmeyer: Corr. Bl. f. Schweiz. Aerzte, 1919, XL, 47.

20. Rosenthal and Bauer: Wein. klin. Wochnschr, 1912, XXV, 879.

21. Baldwin: Anatom Rec., V. 121.

22. Akerlund: Mitteil. a. d. Grenzgeb. d. Med. u. Chir., XXXVI, 1923.

TREATMENT OF GANGRENE OCCURRING IN DIABETIC PATIENTS*

ROBERT W. KEETON, M. D.,
Associate Professor of Medicine, University of Illinois College of Medicine
CHICAGO

In presenting this case of gangrene of the foot I wish to call to your attention one of the distressing diabetic problems. While the cases of diabetic gangrene are not numerically large, they constitute a large percentage of the diabetic patients found in the free clinics and the county institutions. There are two obvious reasons for this; first, a conservative attempt to save the leg requires a long period of bed rest in a warm atmosphere; second, surgeons are unwilling to operate on such cases, although their judgment tells them that an operative procedure is indicated.

Types of Gangrene—When the occlusion involves either the arcuate or one of the metatarsal arteries the gangrene presents its major manifestations on the dorsum of the foot and in the corresponding toes. On deep pressure there is no tenderness on the plantar surface of the foot. A gangrene is this location tends to remain relatively dry because the amount of tissue excluded from circulation is not great. If a dressing of sterile vaseline be applied the opportunities for secondary infection will be reduced to the minimum. Again, there is a relatively small opportunity for the return flow of blood from this gangrenous area reaching the general circulation and carrying toxic bodies. Experience has shown that this type of gangrene may often be treated conservatively for a considerable period without endangering the patient's life. Furthermore, conservative treatment often renders it possible to save the foot with an amputation of one, two, or three toes.

When the gangrene involves the plantar artery, a different picture is presented. The foot begins to swell, pain is great, and plantar tenderness is marked. This is serious and rapidly endangers the patient's life.

Case Presentation—This patient furnished an instructive study in these types of gangrene. He is a white male aged sixty-two years, who developed some gangrenous patches on the toes of his right foot in 1926. These healed without surgical interference. In August, 1927, these same toes became involved. They were treated conservatively for a while in another hospital, but they eventually had to be removed. You can easily see the absence of the four toes and the solitary great toe remaining. In other words, he had an involvement such as I described under the first type of gangrene. Conservative treatment on the first occasion saved the toes; on the second it saved the man's foot without the toes. On April 14, 1928, the middle toe on the left foot began draining. This was preceded by a severe pain in the left heel. On entrance to the hospital April 24, 1928, he gave definite evidence of involvement of the plantar artery with swelling of the whole foot and marked plantar tenderness. He had what may be called third degree gangrene—the dangerous gangrene—the gangrene demanding action. The history further shows that this man had not been able to sleep for several nights because of pain in the foot, and that he had practically lost his appetite. The examination revealed a right foot with one remaining toe and the scar of the former surgical operation. The left foot was discolored, swollen, was draining freely from the third and fourth toes, was cold to touch, and tender to plantar pressure. Pulse was 120, temperature 101, blood pressure 160/70. The tongue was dryer than normal, although the patient did not complain of thirst. The radials were not especially sclerotic. The eye grounds showed moderate arteriosclerosis but no vascular changes such as occur in the retinitis characteristic of this condition. The urine contained albumin, hyaline and granular casts, sugar, but no acetone. The blood sugar was 204, non-protein nitrogen 60, uric acid 4.96, creatinin 2.31, carbon dioxide combining power 35. At the patient's insistence the case was given the benefit of conservative treatment for a period of ten days. The insulin dosage was gradually increased until he was getting 80 units per day in divided doses. This covered a glucose intake in diet of 130 grams. The urine showed an output of 2 grams per day. At the close of this period the fasting blood sugar was 140, non-protein nitrogen 53, uric acid 4.15, carbon dioxide combining power 33. The temperature and rapid pulse persisted. It was, therefore, obvious that the man's general

*Clinic given at the Research and Educational Hospital before the Medical Section of the Illinois State Medical Society.

condition had not improved through this conservative management.

Some Physiological Effects of Gangrene—Suppose we examine more critically this clinical picture. The foot was a moist mass of tissue, which was a breeding ground for saprophytic organisms and which was still sufficiently connected with the general circulation to allow of rather free absorption. These products of putrefaction are potent toxins. Almost everyone is familiar with cases of food poisoning and with the symptoms of ptomain poisoning, which follow the ingestion of meat which has undergone bacterial decomposition. The cardinal symptoms are gastro-intestinal cramps and diarrhea. For the same reason a diabetic with a gangrene may complain of abdominal cramps and loseness of bowels. He may even express surprise that his constipation of years' standing has suddenly improved, since his foot became sore, and he may even request a little medicine to check the bowel movements. If the physician is not familiar with this symptom he in turn may be surprised at the difficulty with which the diarrhea is controlled. He will probably start with a bismuth preparation, and, when he finds that this does not act so well, will resort to paregoric and powdered opium without lessening the number of bowel movements. In my experience such a diarrhea is often controlled with the greatest difficulty.

A second effect of these toxins is on the circulation. The total effects have been grouped together under the name of "Toxemic Shock" and this shock state has been analyzed experimentally by making use of histamin as the intoxication agent. Small doses of histamin dilate the capillary bed so that it may be two to three times its former size. At the same time the permeability of the capillary walls is increased and the fluid portion of the blood extravasates rapidly into the lymph channels. This reduces the blood volume so that there is a real concentration of the blood, and this lessened blood volume is circulating in a capillary bed which is from three to four times too large for it. Finally, since the blood is concentrated, the viscosity is increased and the capillary friction is increased. The heart then begins to beat more rapidly to compensate for this failing volume of blood and the picture of cardiac collapse presents itself. It is only a secondary cardiac failure; the primary failure is in the capillary bed with an inadequacy of blood volume. This is the condition which Cannon spoke of as an "Exemia" and noted that it was the important physiological defect in shock.

A third effect of toxic absorption is on the kidneys. This may vary from a mild retention of nitrogen to a reduction in urinary volume or a suppression of urine. This may be due to a specific effect on the kidney cells or to an effect on the kidneys through the circulation and the glomeruli in particular. In this patient, it should be noted that a nitrogen retention and a nephritic acidosis (retentive acidosis) existed. How much of this kidney effect is due to the recently established gangrene and how much is due to long standing disease of the kidney can be determined only by the future course of the case.

A gangrenous foot carries a fourth threat to the patient, that is, the possibility of a pulmonary infarction with a secondary broncho-pneumonia. While the possibility of this accident is remote, since the occlusion is on the arterial rather than the venous side, yet it should not be ignored.

Amputation—Treatment of Choice—From the above considerations it is obvious that there was but one indication and that was for amputation of the foot. From a surgical viewpoint the patient was a poor risk. The surgical consultant suggested that a preliminary blood transfusion would make him a better risk. So a transfusion of 425 cc. of citrated blood was given on May 5, 1928, and the leg amputated above the knee on May 6, 1928. The amputation was done at 11 a. m. At 4 p. m. the patient was eating his usual feeding and drinking freely. On the day following the operation the patient followed his regular schedule of eating and insulin injections. Since then he has made an uneventful recovery.

It is often surprising how well these patients tolerate the immediate operation. As a rule they do not develop any serious vomiting, a thing which is most feared in the post operative management of diabetics. They are more apt to develop kidney insufficiency with all of its complications. If this does not occur, then the length of convalescence is determined by the

nature of the blood supply at the site of the amputation. If this is good, rapid healing occurs; otherwise a draining stump may exist for a long period of time. The present patient, in spite of his nitrogen retention, did not develop a kidney insufficiency and he has a stump which is healing satisfactorily.

The results of the amputation may best be summarized as follows:

1. Immediately the temperature disappeared, the pulse dropped, and the profuse night sweats stopped. In short, he lost his toxic state.

2. The sugar tolerance increased rapidly. Before the operation 80 units of insulin were required to keep his urine relatively sugar free on an intake of 130 grams of glucose. Three days after the amputation he was taking 30 units and at the end of seven days 20 units and the urine remained entirely sugar free.

3. The kidney function showed evidence of some recovery as shown by the blood chemistry studies.

	Pre-Operative	Post-Operative	
	8 days	9 days	15 days
Non-Protein Nitrogen	60	49	....
Uric Acid	4.96	3.71	....
Creatinin	2.31	1.93	....
Blood Sugar	154	171	....
Carbon Dioxide Combining Power	33	....	41

It may be concluded that these apparently poor surgical risks should be subjected to operation. There is good evidence that this man's kidney function was improved by the amputation and it is not amiss to suppose that this improvement will continue. I wish to conclude this clinic by stating that the gangrenes of the type just discussed (the third degree gangrenes) are real surgical emergencies and should be accepted as such by the surgeon. These patients should not be consigned to medical deaths.

A REAL HEALTH BOARD

Strolling along the quays of New York Harbor an Irishman came across the wooden barricade placed around the enclosure where emigrants suspected of suffering from contagious diseases are isolated.

"Phwat's this boarding for?" he inquired of a bystander.

"O," was the reply, "that's to keep out fever and things like that, you know."

"Indade!" said Pat, "Oi've often heard of the Board of Health, but, bejabbers, it's the first time Oi've seen it!"

DONTS FOR EAR, NOSE AND THROAT SURGEONS

Schwartz in "Eye, Ear, Nose and Throat Monthly," March, 1928, gives the following:

1—Do not use the carbolic-menthol mixture to relieve pain, except in otitis externa.

2—Cases of furunculosis of the external canal should not be irrigated.

3—Don't be in too great a hurry to open inflammed gums, especially in children.

4—Wax should be washed out of the canal, not dug out.

5—The turbinate ought not to be sacrificed too readily.

6—Do not figure on relieving obstructed nasal breathing by a septum operation.

7—Only diseased tonsils should be removed.

8—The transillumination test is often misleading in sinus diagnosis.

9—Radical sinus operations are rarely necessary.

10—Avoid instrumentation in laryngeal affections.

These suggestions represent the results of many years of close observation.

OUR OWN BODIES

"You know the model of your car;
You know just what its powers are.
You treat it with a deal of care
Nor tax it more than it can bear.
But as to self—that's different;
Your mechanism may be bent,
Your carburetor gone to grass,
Your engine just a rusty mass.

Your wheels may wobble, and your cogs
Be hauled over to the dogs.
And you skip and skid and slide
Without a thought of things inside.
What fools, indeed, we mortals are
To lavish care upon a car
With ne'er a bit of time to see
About our own machinery!"

—John Kendrick Bangs.

WHO IS LOONEY?

A clergyman had occasion to preach to the inmates of an insane hospital. During the sermon he noticed one of the patients listening most intently; his eyes riveted upon the speaker's face, and body bent forward. His interest was most flattering. After the service, the preacher noticed that the man spoke to the superintendent, so as soon as possible, he made this inquiry: "Didn't that man speak to you about my sermon?"

"Yes," was the reply.

"Would you mind telling me what he said?"

The superintendent tried to evade, but the preacher insisted.

"Well," he said at last, "the man said, 'Just think, he's out and I'm in.'"

Society Proceedings

ADAMS COUNTY

The annual business meeting of the society, held at the Elks' Culb in Quincy, December 10, 1928, was attended by 32 members.

Dr. O. F. Shulian presented a patient on whom he had operated for carcinoma of the bladder. Following the operation x-ray treatment was given. The patient was clinically well ten months after the operation and, in spite of the fact that more than half the bladder had been removed, his bladder capacity was greater than before the operation. Dr. Harold Swanberg gave a report of the interesting events in connection with the annual meeting of the Radiological Society of North America held in Chicago during the previous week.

Drs. Martha Anderson, Norbert Blickhan, and C. N. Becker were elected members of the society. Dr. Irwin was called upon for a brief report concerning the activities of the entertainment committee during the year. In the absence of Dr. R. A. Harris, Dr. H. S. Maupin gave a brief report for the library committee. Dr. J. A. Koch gave a very comprehensive and detailed report concerning the office of the treasurer during the year. Dr. Harold Swanberg read the report of the secretary, and Dr. W. H. Baker made a few remarks concerning the president's office.

Dr. J. W. E. Bitter was elected president for the ensuing year; Dr. H. S. Jurgens, first vice-president; Dr. H. S. Maupin, second vice-president; Dr. Harold Swanberg, secretary; Dr. J. A. Koch, treasurer; Dr. Ralph McReynolds, medical legal member; Dr. T. B. Knox, delegate for two years; Dr. Walter Stevenson, alternate delegate for two years; Drs. Miller and Cohen, censors for two years. At this time Dr. J. W. E. Bitter presented his resignation as member of the Board of Censors, and Dr. Ray Mercer was elected to serve as member of the Board of Censors for three years; Dr. E. L. Caddick to fill the unexpired term of Dr. J. W. E. Bitter (2 years) as member of the Board of Censors; Dr. C. A. Wells, member of the library committee for three years.

At this time the president appointed Dr. Center and Dr. Williams to escort the newly-elected president, Dr. Bitter, to the chair. Dr. Bitter expressed his appreciation for the honor conferred upon him, pledged himself to cooperate in every way possible to make the ensuing year a success. A motion presented by Dr. J. A. Koch that the dues for 1929 be continued at $20 was carried. A motion presented by the secretary that the society renew its contract with the present publishers for the *Quincy Medical Bulletin* for 1929, which entails an expense of $100, was carried. Dr. Warren Pearce made a motion that the secretary be given the same honorarium as last year, namely $100. Carried. The library committee was instructed to bring in a full report of the proposed expenses to furnish and maintain the library, to be made to the society at a subsequent meeting. The secretary made a motion that the January meeting be a social meeting and be referred to the entertainment committee with full power. Carried. The secretary made a motion that honorary membership be conferred on Dr. Joseph C. Bloodgood of Baltimore, Maryland. Carried.

Meeting adjourned at 11:15.

HAROLD SWANBERG, M. D., Sec.

CHRISTIAN COUNTY

The Christian County Medical Society met November 27, 1928, at the Taylorville country club for the third annual Thanksgiving dinner. Thirty-nine plates were served with turkey and the good things that go with it and if you think we did not have a nice time you have another think coming.

The doctors brought their wives along to grace the tables and increase the enjoyment and the occasion was all we had expected. One thing marred the evening and made one of our members late. Dr. H. M. Wolfe stepped into his office for a few moments before starting and when he went out to get into his car he found it was gone—had been stolen. He soon had the sheriff on the job with the police and then one of our members took him to the dinner. Before the dinner was over the car was recovered and the thief landed in jail.

After the dinner Dr. Eberspacher of Pana told us of his trip to Europe last summer and Dr. J. F. Miller of Palmer told of his recent hunting trip in Arkansas and the thrilling experiences of the chase.

This dinner is an annual affair and is much enjoyed by all who have the opportunity to attend.

D. D. BARR, Secretary.

COOK COUNTY

Joint Meeting Chicago Medical Society and the Radiological Society of North America, Dec. 8, 1928

Professor Arthur Compton, University of Chicago—"Some Physical Effects of X-rays."

Professor William T. Bovie, Northwestern University—"The Stuff We Are Made Of." (Illustrated by Lantern Slides.)

Joint Meeting Chicago Society and the Chicago Council of Medical Women, Dec. 12, 1928

Roentgen Therapy in Fibromyomata and Other Benign Gynecologic Conditions—Mary Hanks. (A Clinical Report covering 12 years' experience)

Discussion—Maximilian J. Hubeny and Sarah Hobson.

Carcinoma of the Fundus Uteri—Leda J. Stacy, Mayo Clinic, Rochester.

Discussion—Henry Schmitz.

Regular Meeting, December 19, 1928

INFLUENZA

The Present Influenza Epidemic—Arthur H. Kegel, Commissioner of Health.

Treatment of Influenza—Charles H. Miller.

The Relation of Developmental Abnormalities at the Lumbo-Sacral Juncture to Low Back Pain and Disability—Russell Hibbs, New York, N. Y.

Discussion—Paul B. Magnuson, E. W. Ryerson, Hollis E. Potter.

KANE COUNTY

The Kane County Medical Society entertained the members of the Kane County Woman's Auxiliary at a dinner-dance the evening of December 12 at the Elgin State Hospital. About one hundred were present. A very enjoyable program of music and readings was given during the dinner.

1929 officers for the Kane County Medical Society were also elected at this time: President, Doctor Raymond Franklin Dowell of Elgin, and Secretary, Doctor Leland Hurd Anderson of Aurora.

Mrs. H. H. West of Elgin is President of the Kane County Woman's Auxiliary and Mrs. R. T. Hinton of Elgin, Secretary.

KNOX COUNTY

The regular monthly meeting of the Knox County Medical Society was held, December 11, at the Galesburg Club, where, following a dinner, Dr. Peterson of the Surgical Staff of the Iowa State University Hospital, presented a very interesting paper on "The Relation of Cholecystography to Gall Bladder Surgery."

Regular action was taken at this meeting to raise the yearly dues of the members of the Society to eighteen dollars a year to provide adequately for the growing needs of the Society.

B. V. McClanahan, Secretary.

Marriages

Kenneth Lindsey Hood, Belvidere, Ill., to Miss Ruth Elizabeth Ziegler of Elgin, at Chicago, November 28.

Arthur Grand Pre Falls, Chicago, to Miss Lillian Steele Proctor of Brooklyn, N. Y., at Brooklyn, December 6, 1928.

Personals

Walter W. Boyne, East St. Louis, has been elected coroner of St. Clair County and has appointed as deputies Drs. Leo L. Madden, East St. Louis, and Rudolph C. Heiligenstein, Belleville.

Dr. Patrick J. H. Farrell has been elected commander of the Chicago Medical Post of the American Legion for the seventh time.

Arthur H. Compton, Ph.D., professor of physics, University of Chicago, was awarded a gold medal at the annual meeting of the Radiological Society of North America in Chicago, December 6, for his research in the field of light.

Dr. Charles W. Edmunds, professor of materia medica and therapeutics, University of Michigan Medical School, Ann Arbor, addressed the Chicago branch of the American Pharmaceutical Association, December 11, on "Stropanthus and Strophanthins."

Dr. Robert T. Frank, New York, addressed the Chicago Gynecological Society, December 13, on "Three Phases of Gynecologic Plastic Surgery," and Dr. Robert M. Grier on "An Analysis of Fifty Cases of Consecutive Ectopic Pregnancies."

At the annual banquet of the Radiological Society of North America, December 6, William T. Bovie, Ph.D., professor of biophysics, Northwestern University Medical School, was awarded the John Scott medal, a Philadelphia award which includes $1,000, for contributions to medicine on the study and development of equipment whereby incisions may be made with an electric current instead of the knife. Electrical surgery, Dr. Bovie said, will find its greatest usefulness in the field of general surgery. Operations which usually are accompanied by much loss of blood have been performed by electrical surgery without bleeding. The current closes the blood vessels as it makes the incision.

News Notes

—The new Edgewater Hospital at Ashland and Hollywood avenues, Chicago, has been opened.

—The Physicians' Fellowship Club, 2451 Kedzie Boulevard, was addressed, December 7, by Dr. Norman Zolla on "Pseudo-Charity, Part and Full Pay Clinics and the Impoverishment of American Physicians."

—The Chicago Council of Medical Women will be addressed, January 4, at the Medical and Dental Arts Club, by Dr. Alice K. Hall on "Ophthalmoscopy in General Disease," and by Dr. Agnes Beulah Cushman on "The Eye in the Diagnosis of Brain Disease."

—The Chicago Surgical Society held its December meeting at the Cook County Hospital in the morning, December 7. Among others, Dr.

Eugene St. Jacques, Montreal, read a paper on "Clinical Aspects of Splenomegaly," and Dr. Norman S. Shenstone, Toronto, on "Treatment of Empyema Tuberculosis."

—The Chicago Society of Internal Medicine was addressed, December 17, at the City Club by Dr. William J. Gallagher on "Effect of Acid Injection and Trauma on Jejunal Transplants to the Stomach"; Dr. Alfred Koehler, "Hormones of the Suprarenal Gland," and Dr. Harry Singer, "Recovery from Free Perforation of Peptic Ulcer Without Operation."

—The Illinois State Trudeau Society met at Champaign in conjunction with the county medical society, December 13. The speakers were Drs. Clarence L. Wheaton, Minas Joannides, Robert S. Berghoff, Frederick Tice and Newell C. Gilbert, all of Chicago; Walter H. Watterson, Maywood; Frank Deneen, Bloomington, and William D. Chapman, Silvis.

—The Institute of Medicine and the Society of Medical History of Chicago will meet jointly, January 25; Dr. Edmund Andrews will read a paper on "The Origins of Greek Medicine," illustrated; Dr. Benjamin Barker Beeson, "Corvisart: His Life and Work," and Dr. William Snow Miller, University of Wisconsin, "John D. Godman: Anatomist, Naturalist and Medical Editor."

—The fifty-fifth annual meeting of the North Central Illinois Medical Association was held at Peoria, December 4, under the presidency of Dr. William A. McNichols, Dixon. Among others, Drs. Carle E. Black, Jacksonville, presented "A Study in Cholecystography"; Francis L. Reder, St. Louis, "Remarks on Paralytic Ileus"; Arthur Sprenger, Peoria, "The Obstructive Prostate and Its Treatment," and James P. Houston, Sterling, "An Old Doctor's Reminiscences." Among the speakers from Chicago were Drs. Samuel S. Winner, Samuel J. Burrows, Clarence W. Hopkins and Roy E. Flesher.

—The Illinois Masonic Hospital, Chicago, is undertaking to raise $750,000, which is to be used to pay off the mortgage, enlarge the nurses' home, and for endowment for maintenance of the hospital. The charitable work performed by the hospital in the last annual report is listed as more than $88,000, of which nearly half was donated by the medical staff. Dr. Thomas R. Ponton, formerly superintendent of the Vancouver General Hospital, Vancouver, B. C., and of the Hollywood Hospital, Hollywood, Calif., has been appointed superintendent of the hospital.

—The Medical Women's Club of Chicago held a Christmas party on December 19 at the Medical and Dental Arts Club on Wabash avenue and Lake street. Women medical students and internes were the invited guests. The beautifully decorated room was filled to capacity. Dr. Julia C. Strawn, president of the club, was toastmistress. The banquet was followed with an elaborate program, consisting of readings, fancy dancing and music. Dr. Julia Holmes Smith, the oldest member of the club, was given a special greeting, to which she cheerfully responded.

—At the Chicago State Hospital, special investigative work is carried on with ketogenic diets and acid producing drugs in the treatment of epilepsy. Eighty patients including all kinds of epileptics and feeble minded persons with convulsions have been under treatment for several months. A specially trained dietitian has supervision of the menus and has made the diet so attractive that practically no objections have been made by the patients. Affiliated nurses from the State School for Psychiatric Nursing are in charge of the nursing work. Laboratory work to determine the changes in metabolism of patients in acidosis is carried on.

—The middle section of the American Laryngological, Rhinological and Otological Society will meet jointly, January 9, 9 a. m., with the Chicago Laryngological and Otological Society at the Palmer House. Physicians are cordially invited. The program includes ten papers for the day with speakers from several cities. No essay will occupy more than fifteen minutes. Visiting members will be guests of the local society at luncheon and dinner. Others may obtain tickets at the desk. Dinner will be informal. The evening speakers will be Dr. Arthur M. Corwin, Gordon J. Laing, Ph.D., dean, Graduate School of Arts and Literature, University of Chicago, and Dr. Morris Fishbein, editor of THE JOURNAL. Clinics will be held at various hospitals the following day.

—The state department of health reports that maternal hygiene made a gain in Illinois last year, when deaths of mothers resulting from childbirth complications dropped 15 per cent. below those of 1926. The number last year was

717. The leading cause of maternal deaths was puerperal septicemia, which caused 234. Albuminuria was the second important cause, accounting for 187 deaths. Twenty-five counties in the state last year escaped without the loss of a single mother from puerperal causes, and their total births amounted to 6,315. Two cities, Maywood and Forest Park, whose combined population is 30,000, enjoyed the same distinction. The health department considers that the improvement in maternal mortality is due to the popular application of scientific medical knowledge. The lowest mortality figures on record in Illinois among both mothers and infants are those for 1927.

—Heart disease in Illinois last year, the state department of health says, not only led the mortality column again, but took an upward step. Deaths attributed to heart disease in Illinois, exclusive of Chicago, rose from 7,704 to 8,089, bringing the rate up to 192 per hundred thousand of population; 35 per cent. of these 8,089 deaths were among persons under 60 years of age. The fact that 595 of them were in persons under 40 years of age leads to the conclusion that a considerable number of these deaths are preventable. The second highest cause of death in downstate Illinois was nephritis, which accounted for 4,769. About 23 per cent. of the deaths from chronic nephritis occurred among persons less than 60 years of age. The third chief cause of death last year was cancer, with 4,346 deaths, and a little more than half of these were in persons less than 60 years of age. Suicide last year was led by only twelve other causes. In Illinois, outside of Chicago, 621 persons killed themselves, an increase of fifty-five over 1926. Homicide declined slightly, the number falling from 327 to 308. Deaths due to automobile accidents increased, and those from railroad accidents declined.

—Dr. Herman N. Bundesen, who became coroner of Cook County, December 3, has announced the appointment of coroner's physicians, each of whom, he said, has been selected with the assistance of an advisory committee from the faculties of the four leading universities in Chicago. The appointments are as follows:

Dr. George J. Rukstinat, for six years assistant to Dr. LeCount, and at present instructor in pathology at the University of Chicago.

Dr. Eustace L. Benjamin, assistant resident pathologist at the county hospital.

Dr. Samuel A. Levinson, assistant professor of pathology at the University of Illinois College of Medicine, and assistant director of research at the Municipal Tuberculosis Sanatorium.

Dr. Chester C. Guy, instructor in pathology at Loyola University since 1924, and pathologist at St. Bernard's Hospital.

Dr. Francis D. Gunn, pathologist at Wesley Memorial Hospital, and associate professor of pathology at Northwestern University Medical School.

Dr. Hamilton Rodell Fishbäck, assistant professor of pathology at Northwestern University Medical School.

Dr. Paul G. F. Schmidt, resident pathologist for two years at the county hospital, and member of the coroner's staff since last May.

In addition, Drs. E. R. LeCount, professor of pathology and chairman of the department, Rush Medical College, and Richard H. Jaffe, director of the laboratory, Cook County Hospital, and associate professor of pathology and bacteriology, University of Illinois College of Medicine, were appointed as consulting coroner's pathologists. Dr. Bundesen is said to be the first physician coroner in Cook County in sixty-five years.

Deaths

EMMITT H. BOTTOM, East St. Louis, Ill.; Washington University School of Medicine, St. Louis, 1897; a former president of St. Clair County Medical Society; aged 58; died at Christian Welfare Hospital, November 16, of cerebral hemorrhage.

ALMA ELIZABETH BRAUCHER, Lincoln, Ill.; Hering Medical College, Chicago, 1895; aged 70; died, October 30, at the Deaconess Hospital, of carcinoma of the stomach.

CHARLES B. BROWN, Sycamore, Ill.; University of Buffalo School of Medicine, 1876; a Fellow A. M. A.; on the staff of the Sycamore Municipal Hospital; aged 81; died, November 9, of chronic myocarditis.

GEORGE WINSTON IRAY BROWN, Chicago; General Medical College, Chicago, 1878; aged 82; died, December 5, of la grippe and chronic myocarditis.

FRANK M. CLEMENT, Chicago, Ill.; Albany Medical College (N. Y.), 1890; a member of Illinois State Medical Society; aged 65; died, November 14, of arteriosclerosis.

JOHN NEIL COX, Rio, Ill.; Medical Department of

the University of Wooster, Cleveland, 1889; aged 71; died, August 17, at the Cottage Hopsital, Galesburg.

OLIVER H. DONALDSON, Chicago; College of Physicians and Surgeons, Chicago, 1894; aged 58; died, September 13, of organic heart disease.

EMILIUS CLARK DUDLEY, Chicago; Long Island College Hospital, Brooklyn, 1875; professor emeritus of gynecology, Northwestern University Medical School; in 1922 visiting professor, Hunan-Yale College of Medicine, Changsha, China, and the Peking Union Medical College, Peking, China; member of the Illinois State Medical Society; past president of the American Gynecological Association; formerly member of the board of education of Chicago; served during the World War; consulting gynecologist to St. Luke's Hospital; author of "Principles and Practice of Gynecology"; aged 78; died, December 1, of cerebral hemorrhage.

DANIEL F. DUGGAN, Alton, Ill.; St. Louis College of Physicians and Surgeons, 1902; member of Illinois State Medical Society; health officer of Alton; aged 55; died, December 9, at St. Joseph's Hospital, Alton.

JAMES WILLIAM GERMER, Chicago; Northwestern University Medical School, Chicago, 1900; a Fellow A. M. A.; aged 56; died, November 13, of myocarditis ad nephritis.

CLARENCE EDMONDS HEMINGWAY, Oak Park, Ill.; Rush Medical College, Chicago, 1896; a Fellow A. M. A.; on the staff of the Oak Park Hospital; aged 57; died at his home, December 6, of a self-inflicted gunshot wound.

EARL L. HENDRICKS, Lanark, Ill.; Northwestern University Medical School, 1903; member of Illinois State Medical Society; aged 48; died, December 15, at Freeport, of influenza and scarlet fever.

WILLIAM HESSERT, Chicago; Northwestern University Medical School, 1892; member of Illinois State Medical Society; chief of staff of Grant Hospital and staff member of Alexian Brothers Hospital; aged 57; died, November 10, of pneumonia.

ALLISON E. LAUVER, Stronghurst, Ill.; Barnes Medical College, St. Louis, 1899; member of Illinois State Medical Society; aged 53; died, December 6, from injuries received in a railroad crossing accident.

CORNELIUS ARTHUR LEENHEER, Chicago; Harvey Medical College, Chicago, 1901; a Fellow A. M. A.; University of Illinois College of Medicine, Chicago, 1909; aged 52; died, November 23, at the Chicago Memorial Hospital, of heart disease and pneumonia, following influenza.

PAUL G. MANLEY, Mount Carmel, Ill.; Miami Medical College (Ohio), 1879; aged 73; a former member of Illinois State Medical Society; died at the home of his son in Evanston, November 27, of angina pectoris.

ALEXANDER A. MAXIMOW, professor of anatomy, University of Chicago, aged 54, was found dead in bed, December 4, of coronary sclerosis and myocarditis. Dr. Maximow was born in St. Petersburg, Russia, in 1874, and received his M.D. degree from the Imperial Military Academy of Medicine in that city in 1899. From 1903 to 1922, he was professor of histology and embryology at his alma mater, and from 1918 to 1922 was a member of the faculty of the University of St. Petersburg. He was a member of the aristocracy of Russia and held the rank of actual state councilor in the imperial army, 1896-1917. In 1922 he left Russia with his wife and sister, and came to the United States, since when he has been at the University of Chicago. Dr. Maximow was the author of a textbook on histology and of about seventy articles on histology and embryology in English, Russian and German, and was an authority on blood and connective tissue. He emphasized the functional approach to anatomy, and much of his research was done on living tissue. He was a member of the American Association of Anatomists, the American Association of Pathologists and Bacteriologists and the American Association for Experimental Pathology, and was able to speak a number of languages. In his death the profession has lost a great investigator.

ROBERT H. T. NESBITT, Waukegan, Ill.; General Medical College, Chicago, 1896; aged 77; died, December 2; after an illness of several years, complicated by a recent fracture of the hip.

THEODORE REAGAN, San Diego, Calif.; Rush Medical College, Chicago, 1893; practiced for many years at Danville, Ill.; aged 63; died at Oak Park, Ill., as the result of paralysis which occurred in June.

I. CARSON SMITH, Stockton, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1884; a Fellow A. M. A.; pastpresident of the Jo Daviess County Medical Society; president of the school board; aged 68; died, November 8, of pernicious anemia.

HOMER MERRICK THOMAS, Chicago; Rush Medical College, 1882; a staff member of Cook County, Chicago and Mary Thompson hospitals; aged 70; died, December 17, of broncho-pneumonia and myocarditis.

ALFRED A. WHIPPLE, Quincy, Ill.; Eclectic Medical Institute, Cincinnati, 1876, and the Hahnemann Medical College and Hospital, Chicago, 1880; aged 83; died, November 14, at the home of his son in Benton Harbor, Mich., of arteriosclerosis.

D. SMITH WISEHART, Decatur, Ill.; Medical College of Ohio, Cincinnati, 1879; aged 75; died, February 21, at the Masonic Home, Sullivan, of gastric ulcer.

ry, 1929

27, of

natomy,
dead in
myocar-
ersburg,
ee from
in that
rofessor
ter, and
culty of
a mem-
he rank
y, 1896-
d sister,
he has
aximow
and of
ryology
an au-
empha-
d much
He was
Anat-
ologists
ociation
o speak
ofession

General
ed, De-
compli-

Medi-
y years
Ill., as
e.

Physi-
Fellow
County
d; aged
.

Medical
y, Chi-
; died,
nyocar-

Medical
emann
; aged
son in

l Col-
Febru-
gastric